The 30 indexed (fPi) canonical sets of 7 triples (which get sign masks applied to make valid octonions).

1	{{1, 2, 3}, {1, 4, 5}, {1, 6, 7}, {2, 4, 6}, {2, 5, 7}, {3, 4, 7}, {3, 5, 6}}
2	{{1, 2, 3}, {1, 4, 5}, {1, 6, 7}, {2, 4, 7}, {2, 5, 6}, {3, 4, 6}, {3, 5, 7}}
3	{{1, 2, 3}, {1, 4, 6}, {1, 5, 7}, {2, 4, 5}, {2, 6, 7}, {3, 4, 7}, {3, 5, 6}}
4	{{1, 2, 3}, {1, 4, 6}, {1, 5, 7}, {2, 4, 7}, {2, 5, 6}, {3, 4, 5}, {3, 6, 7}}
5	{{1, 2, 3}, {1, 4, 7}, {1, 5, 6}, {2, 4, 5}, {2, 6, 7}, {3, 4, 6}, {3, 5, 7}}
6	{{1, 2, 3}, {1, 4, 7}, {1, 5, 6}, {2, 4, 6}, {2, 5, 7}, {3, 4, 5}, {3, 6, 7}}
7	{{1, 2, 4}, {1, 3, 5}, {1, 6, 7}, {2, 3, 6}, {2, 5, 7}, {3, 4, 7}, {4, 5, 6}}
8	{{1, 2, 4}, {1, 3, 5}, {1, 6, 7}, {2, 3, 7}, {2, 5, 6}, {3, 4, 6}, {4, 5, 7}}
9	{{1, 2, 4}, {1, 3, 6}, {1, 5, 7}, {2, 3, 5}, {2, 6, 7}, {3, 4, 7}, {4, 5, 6}}
10	{{1, 2, 4}, {1, 3, 6}, {1, 5, 7}, {2, 3, 7}, {2, 5, 6}, {3, 4, 5}, {4, 6, 7}}
11	{{1, 2, 4}, {1, 3, 7}, {1, 5, 6}, {2, 3, 5}, {2, 6, 7}, {3, 4, 6}, {4, 5, 7}}
12	{{1, 2, 4}, {1, 3, 7}, {1, 5, 6}, {2, 3, 6}, {2, 5, 7}, {3, 4, 5}, {4, 6, 7}}
13	{{1, 2, 5}, {1, 3, 4}, {1, 6, 7}, {2, 3, 6}, {2, 4, 7}, {3, 5, 7}, {4, 5, 6}}
14	{{1, 2, 5}, {1, 3, 4}, {1, 6, 7}, {2, 3, 7}, {2, 4, 6}, {3, 5, 6}, {4, 5, 7}}
15	{{1, 2, 5}, {1, 3, 6}, {1, 4, 7}, {2, 3, 4}, {2, 6, 7}, {3, 5, 7}, {4, 5, 6}}
16	{{1, 2, 5}, {1, 3, 6}, {1, 4, 7}, {2, 3, 7}, {2, 4, 6}, {3, 4, 5}, {5, 6, 7}}
17	{{1, 2, 5}, {1, 3, 7}, {1, 4, 6}, {2, 3, 4}, {2, 6, 7}, {3, 5, 6}, {4, 5, 7}}
18	{{1, 2, 5}, {1, 3, 7}, {1, 4, 6}, {2, 3, 6}, {2, 4, 7}, {3, 4, 5}, {5, 6, 7}}
19	{{1, 2, 6}, {1, 3, 4}, {1, 5, 7}, {2, 3, 5}, {2, 4, 7}, {3, 6, 7}, {4, 5, 6}}
20	{{1, 2, 6}, {1, 3, 4}, {1, 5, 7}, {2, 3, 7}, {2, 4, 5}, {3, 5, 6}, {4, 6, 7}}
21	{{1, 2, 6}, {1, 3, 5}, {1, 4, 7}, {2, 3, 4}, {2, 5, 7}, {3, 6, 7}, {4, 5, 6}}
22	{{1, 2, 6}, {1, 3, 5}, {1, 4, 7}, {2, 3, 7}, {2, 4, 5}, {3, 4, 6}, {5, 6, 7}}
23	{{1, 2, 6}, {1, 3, 7}, {1, 4, 5}, {2, 3, 4}, {2, 5, 7}, {3, 5, 6}, {4, 6, 7}}
24	{{1, 2, 6}, {1, 3, 7}, {1, 4, 5}, {2, 3, 5}, {2, 4, 7}, {3, 4, 6}, {5, 6, 7}}
25	{{1, 2, 7}, {1, 3, 4}, {1, 5, 6}, {2, 3, 5}, {2, 4, 6}, {3, 6, 7}, {4, 5, 7}}
26	{{1, 2, 7}, {1, 3, 4}, {1, 5, 6}, {2, 3, 6}, {2, 4, 5}, {3, 5, 7}, {4, 6, 7}}
27	{{1, 2, 7}, {1, 3, 5}, {1, 4, 6}, {2, 3, 4}, {2, 5, 6}, {3, 6, 7}, {4, 5, 7}}
28	{{1, 2, 7}, {1, 3, 5}, {1, 4, 6}, {2, 3, 6}, {2, 4, 5}, {3, 4, 7}, {5, 6, 7}}
29	{{1, 2, 7}, {1, 3, 6}, {1, 4, 5}, {2, 3, 4}, {2, 5, 6}, {3, 5, 7}, {4, 6, 7}}
30	{{1, 2, 7}, {1, 3, 6}, {1, 4, 5}, {2, 3, 5}, {2, 4, 6}, {3, 4, 7}, {5, 6, 7}}

The 8 sets of sign masks. Each sign mask (or the set of 7 triples) can be permuted in a consistent way to produce isomorphic sets of 480 octonions.

1	{00, 07, 19, 1E, 2A, 2D, 33, 34}
2	{01, 06, 18, 1F, 2B, 2C, 32, 35}
3	{02, 05, 1B, 1C, 28, 2F, 31, 36}
4	{03, 04, 1A, 1D, 29, 2E, 30, 37}
5	{08, 0F, 11, 16, 22, 25, 3B, 3C}
6	{09, 0E, 10, 17, 23, 24, 3A, 3D}
7	{0A, 0D, 13, 14, 20, 27, 39, 3E}
8	{0B, 0C, 12, 15, 21, 26, 38, 3F}

The index of 8 sign masks (sm) to the 30 fPi (each with 8 Hexadecimal masks).

These can be “inverted” (0↔1) making 16*30=480 octonion permutations. They are assigned to the 30 canonical sets of 7 triples using the maskList:

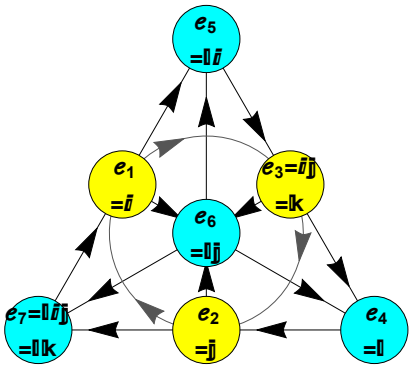
{5, 8, 4, 3, 7, 6, 3, 2, 6, 5, 1, 4, 6, 7, 3, 3, 8, 6, 3, 1, 6, 6, 2, 3, 5, 8, 4, 3, 7, 6}

Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
1	$V_{e\,w_1}^{0}$		0apggsscc 001010100_2	Bn{ 0 0 0 0 0 0 0 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Be 4

flip=False

{1, 3, 2}{1, 6, 4}{1, 5, 7}{2, 7, 4}{2, 6, 5}{3, 4, 5}{3, 6, 7}

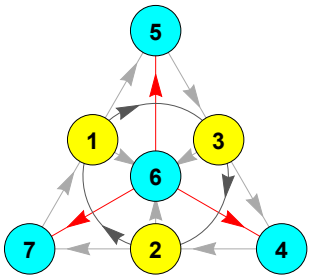
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	$-e_6$	e_7	e_4	$-e_5$
e_2	e_3	−1	$-e_1$	$-e_7$	$-e_6$	e_5	e_4
e_3	$-e_2$	e_1	−1	e_5	$-e_4$	e_7	$-e_6$
e_4	e_6	e_7	$-e_5$	−1	e_3	$-e_1$	$-e_2$
e_5	$-e_7$	e_6	e_4	$-e_3$	−1	$-e_2$	e_1
e_6	$-e_4$	$-e_5$	$-e_7$	e_1	e_2	−1	e_3
e_7	e_5	$-e_4$	e_6	e_2	$-e_1$	$-e_3$	−1

split=1

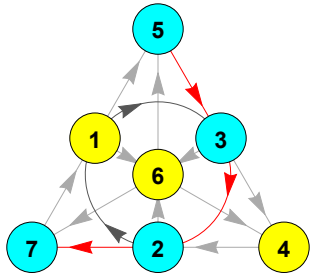
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−6	7	4	−5
2	3	−1	−1	−7	−6	5	4
3	−2	1	−1	5	−4	7	−6
4	6	7	−5	1	−3	1	2
5	−7	6	4	3	1	2	−1
6	−4	−5	−7	−1	−2	1	−3
7	5	−4	6	−2	1	3	1

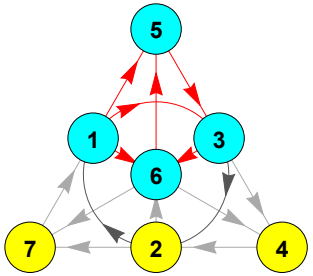
split=2

Fano plane



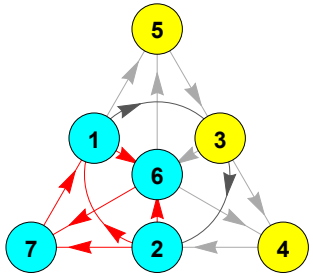
split=4

Fano plane



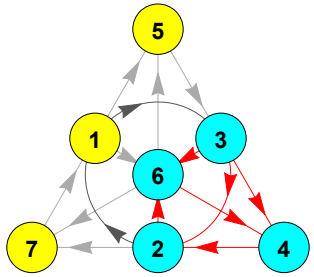
split=6

Fano plane



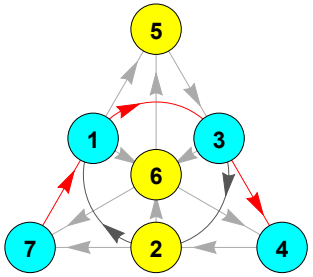
split=3

Fano plane



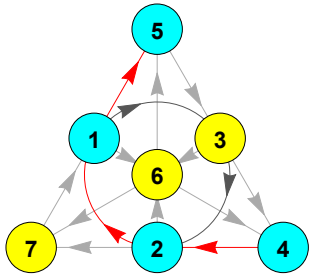
split=5

Fano plane



split=7

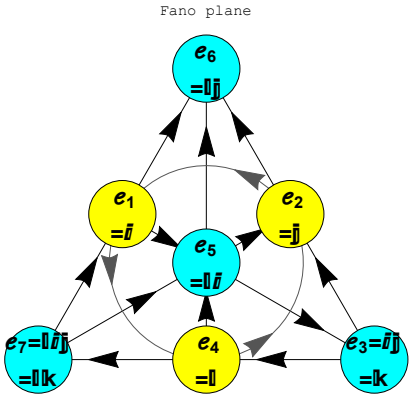
Fano plane



flip=True

{1, 4, 2}{1, 5, 3}{1, 6, 7}{2, 6, 3}{2, 7, 5}{3, 4, 7}{4, 5, 6}

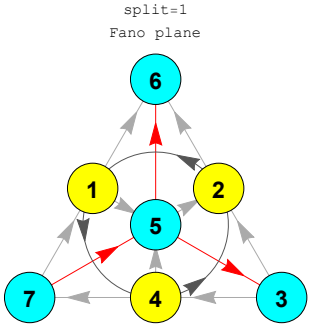
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_5$	e_2	e_3	e_7	$-e_6$
e_2	e_4	−1	$-e_6$	$-e_1$	$-e_7$	e_3	e_5
e_3	e_5	e_6	−1	e_7	$-e_1$	$-e_2$	$-e_4$
e_4	$-e_2$	e_1	$-e_7$	−1	e_6	$-e_5$	e_3
e_5	$-e_3$	e_7	e_1	$-e_6$	−1	e_4	$-e_2$
e_6	$-e_7$	$-e_3$	e_2	e_5	$-e_4$	−1	e_1
e_7	e_6	$-e_5$	e_4	$-e_3$	e_2	$-e_1$	−1

split=1

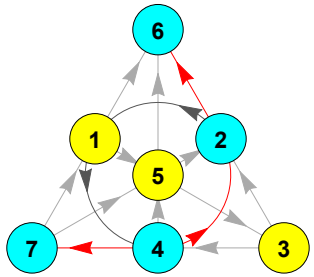
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−5	2	3	7	−6
2	4	−1	−6	−1	−7	3	5
3	5	6	1	7	1	2	4
4	−2	1	−7	−1	6	−5	3
5	−3	7	−1	−6	1	−4	2
6	−7	−3	−2	5	4	1	−1
7	6	−5	−4	−3	−2	1	1

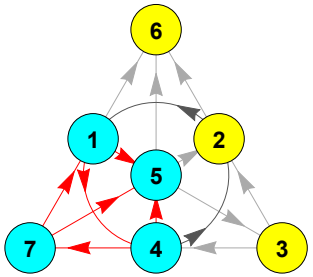
split=2

Fano plane



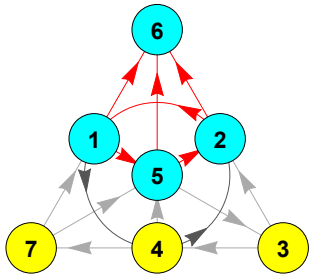
split=4

Fano plane



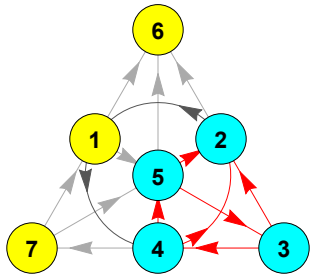
split=6

Fano plane



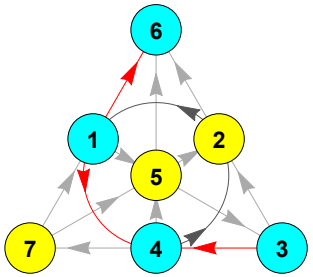
split=3

Fano plane



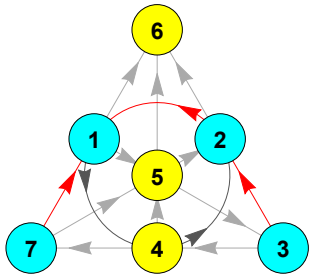
split=5

Fano plane



split=7

Fano plane

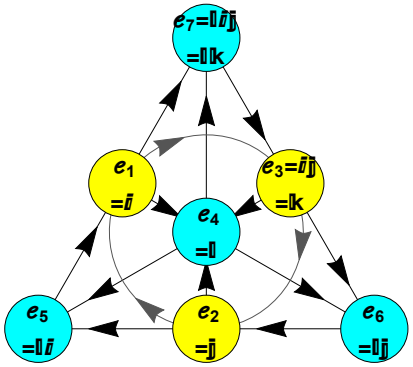


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
10	ν_e w_d ^0_L	▲ ▲	0apggsscc 001010000_2	Bn{ E8{	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Au 79

flip=False

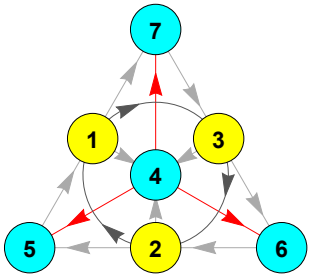
{1, 3, 2}{1, 4, 6}{1, 7, 5}{2, 4, 7}{2, 5, 6}{3, 4, 5}{3, 6, 7}

Fano plane



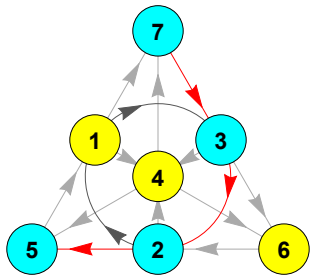
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	e_6	$-e_7$	$-e_4$	e_5
e_2	e_3	−1	$-e_1$	e_7	e_6	$-e_5$	$-e_4$
e_3	$-e_2$	e_1	−1	e_5	$-e_4$	e_7	$-e_6$
e_4	$-e_6$	$-e_7$	$-e_5$	−1	e_3	e_1	e_2
e_5	e_7	$-e_6$	e_4	$-e_3$	−1	e_2	$-e_1$
e_6	e_4	e_5	$-e_7$	$-e_1$	$-e_2$	−1	e_3
e_7	$-e_5$	e_4	e_6	$-e_2$	e_1	$-e_3$	−1

split=1
Fano plane

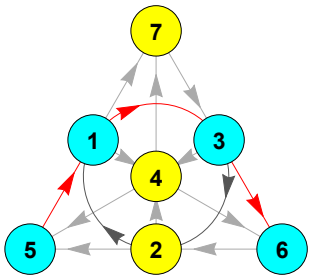


0↦1	1	2	3	4	5	6	7
1	−1	−3	2	6	−7	−4	5
2	3	−1	−1	7	6	−5	−4
3	−2	1	−1	5	−4	7	−6
4	−6	−7	−5	1	−3	−1	−2
5	7	−6	4	3	1	−2	1
6	4	5	−7	1	2	1	−3
7	−5	4	6	2	−1	3	1

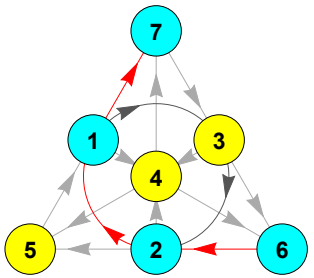
split=2
Fano plane



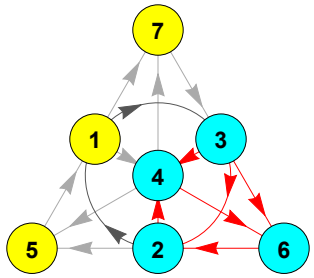
split=4
Fano plane



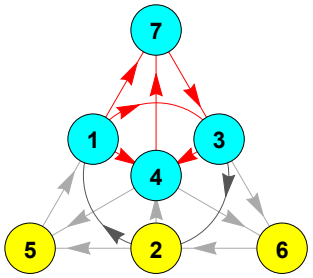
split=6
Fano plane



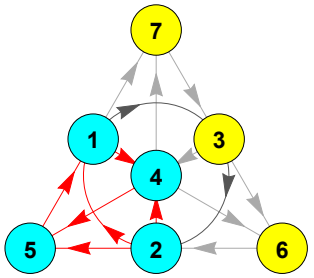
split=3
Fano plane



split=5
Fano plane



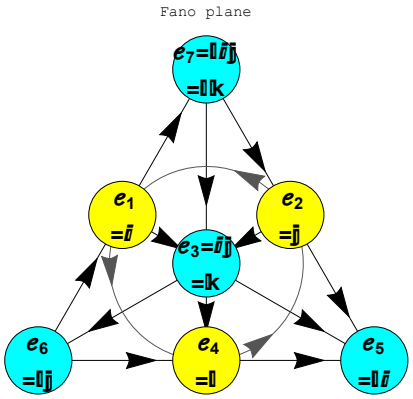
split=7
Fano plane



flip=True

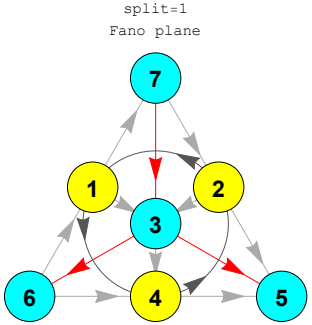
{1, 4, 2}{1, 3, 5}{1, 7, 6}{2, 3, 6}{2, 5, 7}{3, 4, 7}{4, 5, 6}

Fano plane



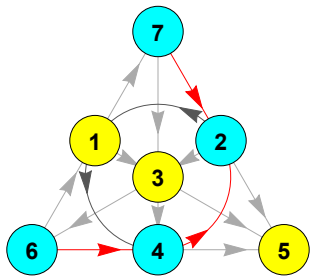
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_5	e_2	$-e_3$	$-e_7$	e_6
e_2	e_4	−1	e_6	$-e_1$	e_7	$-e_3$	$-e_5$
e_3	$-e_5$	$-e_6$	−1	e_7	e_1	e_2	$-e_4$
e_4	$-e_2$	e_1	$-e_7$	−1	e_6	$-e_5$	e_3
e_5	e_3	$-e_7$	$-e_1$	$-e_6$	−1	e_4	e_2
e_6	e_7	e_3	$-e_2$	e_5	$-e_4$	−1	$-e_1$
e_7	$-e_6$	e_5	e_4	$-e_3$	$-e_2$	e_1	−1

split=1
Fano plane

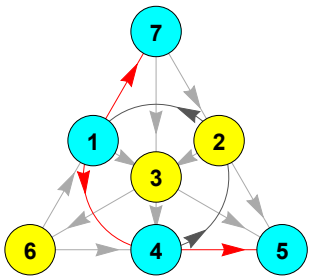


0↦1	1	2	3	4	5	6	7
1	−1	−4	5	2	−3	−7	6
2	4	−1	6	−1	7	−3	−5
3	−5	−6	1	7	−1	−2	4
4	−2	1	−7	−1	6	−5	3
5	3	−7	1	−6	1	−4	−2
6	7	3	2	5	4	1	1
7	−6	5	−4	−3	2	−1	1

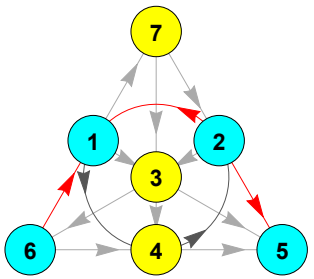
split=2
Fano plane



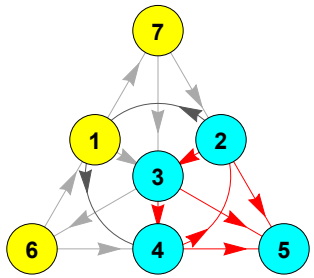
split=4
Fano plane



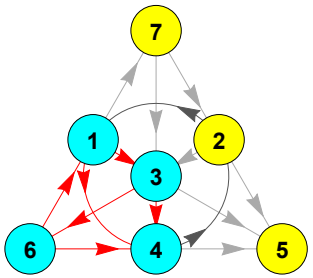
split=6
Fano plane



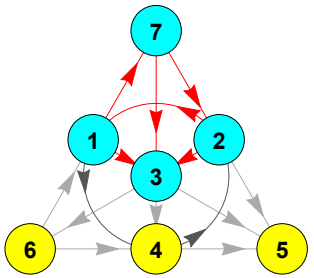
split=3
Fano plane



split=5
Fano plane



split=7
Fano plane

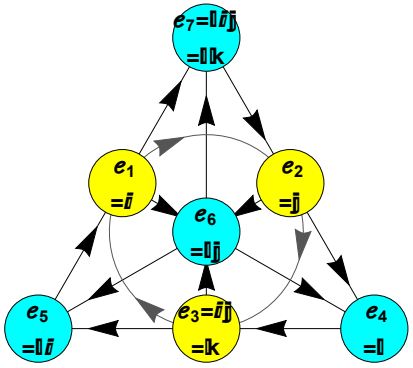


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
11	ν_e w_m $\frac{0}{R}$		0apggsscc 001011100_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Ta 73

flip=False

{1, 2, 3}{1, 6, 4}{1, 7, 5}{2, 4, 7}{2, 6, 5}{3, 5, 4}{3, 6, 7}

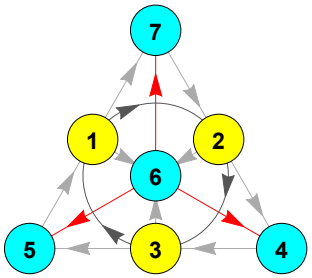
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	$-e_6$	$-e_7$	e_4	e_5
e_2	$-e_3$	−1	e_1	e_7	$-e_6$	e_5	$-e_4$
e_3	e_2	$-e_1$	−1	$-e_5$	e_4	e_7	$-e_6$
e_4	e_6	$-e_7$	e_5	−1	$-e_3$	$-e_1$	e_2
e_5	e_7	e_6	$-e_4$	e_3	−1	$-e_2$	$-e_1$
e_6	$-e_4$	$-e_5$	$-e_7$	e_1	e_2	−1	e_3
e_7	$-e_5$	e_4	e_6	$-e_2$	e_1	$-e_3$	−1

split=1

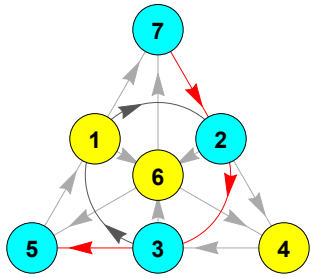
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−6	−7	4	5
2	−3	−1	1	7	−6	5	−4
3	2	−1	−1	−5	4	7	−6
4	6	−7	5	1	3	1	−2
5	7	6	−4	−3	1	2	1
6	−4	−5	−7	−1	−2	1	−3
7	−5	4	6	2	−1	3	1

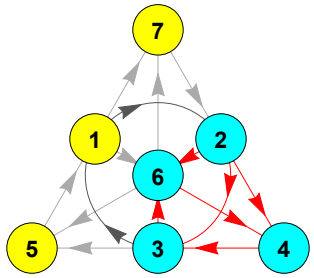
split=2

Fano plane



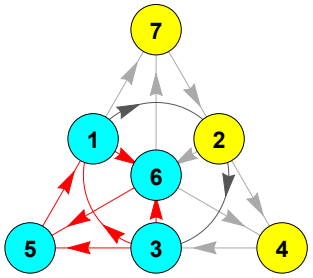
split=3

Fano plane



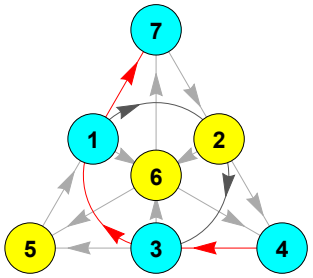
split=4

Fano plane



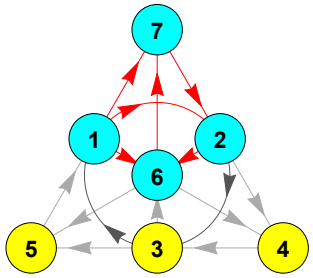
split=5

Fano plane



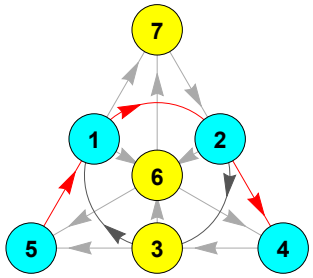
split=6

Fano plane



split=7

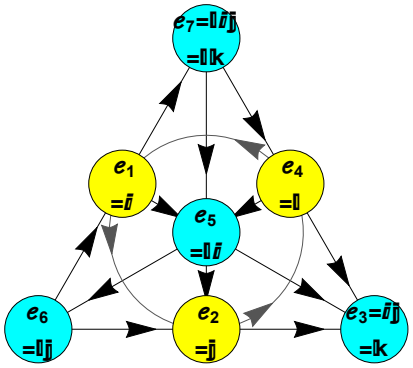
Fano plane



flip=True

{1, 2, 4}{1, 5, 3}{1, 7, 6}{2, 3, 6}{2, 7, 5}{3, 7, 4}{4, 5, 6}

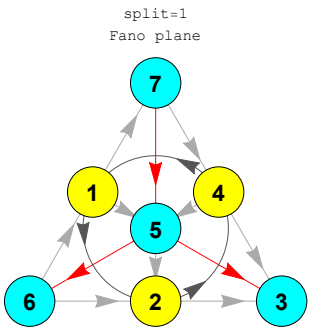
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_5$	$-e_2$	e_3	$-e_7$	e_6
e_2	$-e_4$	−1	e_6	e_1	$-e_7$	$-e_3$	e_5
e_3	e_5	$-e_6$	−1	$-e_7$	$-e_1$	e_2	e_4
e_4	e_2	$-e_1$	e_7	−1	e_6	$-e_5$	$-e_3$
e_5	$-e_3$	e_7	e_1	$-e_6$	−1	e_4	$-e_2$
e_6	e_7	e_3	$-e_2$	e_5	$-e_4$	−1	$-e_1$
e_7	$-e_6$	$-e_5$	$-e_4$	e_3	e_2	e_1	−1

split=1

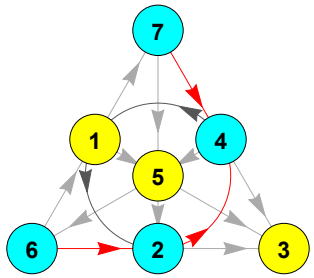
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−5	−2	3	−7	6
2	−4	−1	6	1	−7	−3	5
3	5	−6	1	−7	1	−2	−4
4	2	−1	7	−1	6	−5	−3
5	−3	7	−1	−6	1	−4	2
6	7	3	2	5	4	1	1
7	−6	−5	4	3	−2	−1	1

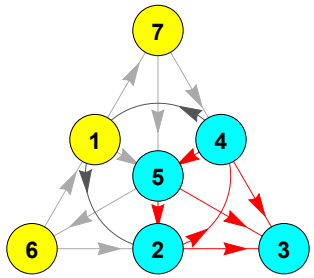
split=2

Fano plane



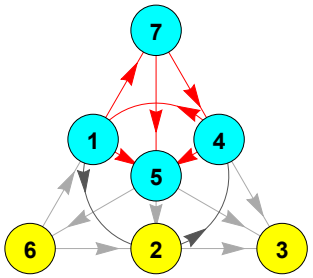
split=3

Fano plane



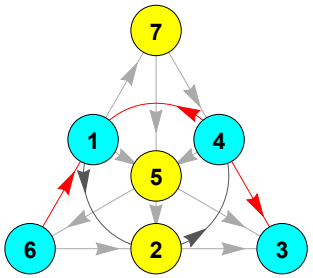
split=4

Fano plane



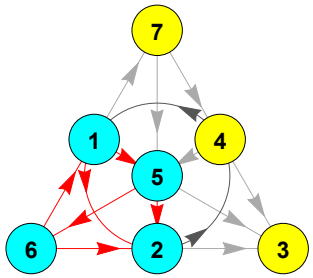
split=5

Fano plane



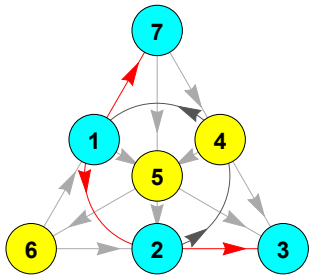
split=6

Fano plane



split=7

Fano plane

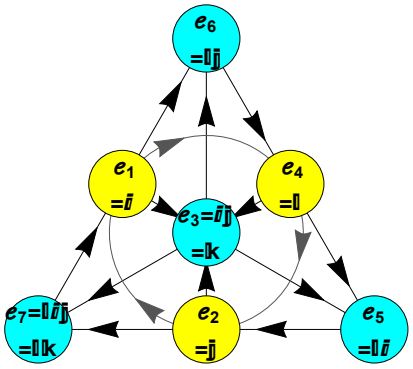


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
12	e_{ym}^{-}	△ ▲	0apggsscc 000011100_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Ho 67

flip=False

{1, 4, 2}{1, 3, 5}{1, 6, 7}{2, 3, 6}{2, 7, 5}{3, 7, 4}{4, 5, 6}

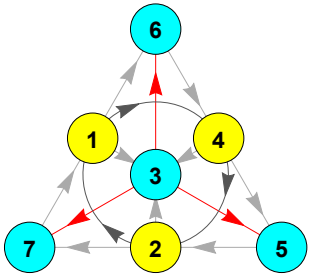
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_5	e_2	$-e_3$	e_7	$-e_6$
e_2	e_4	−1	e_6	$-e_1$	$-e_7$	$-e_3$	e_5
e_3	$-e_5$	$-e_6$	−1	$-e_7$	e_1	e_2	e_4
e_4	$-e_2$	e_1	e_7	−1	e_6	$-e_5$	$-e_3$
e_5	e_3	e_7	$-e_1$	$-e_6$	−1	e_4	$-e_2$
e_6	$-e_7$	e_3	$-e_2$	e_5	$-e_4$	−1	e_1
e_7	e_6	$-e_5$	$-e_4$	e_3	e_2	$-e_1$	−1

split=1

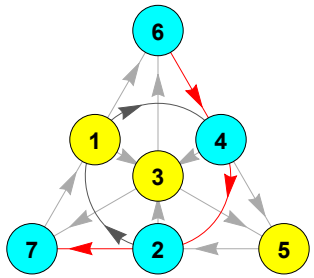
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	5	2	−3	7	−6
2	4	−1	6	−1	−7	−3	5
3	−5	−6	1	−7	−1	−2	−4
4	−2	1	7	−1	6	−5	−3
5	3	7	1	−6	1	−4	2
6	−7	3	2	5	4	1	−1
7	6	−5	4	3	−2	1	1

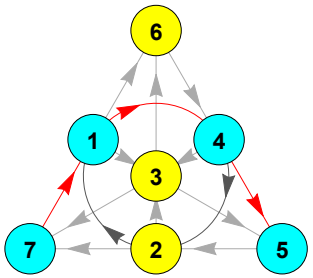
split=2

Fano plane



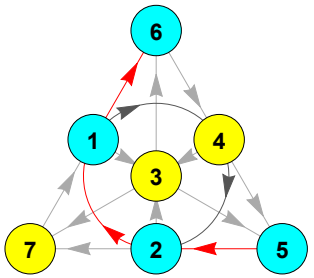
split=4

Fano plane



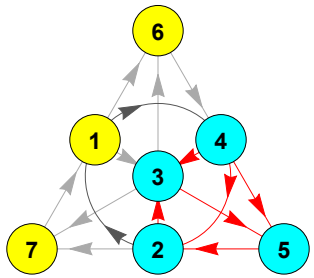
split=6

Fano plane



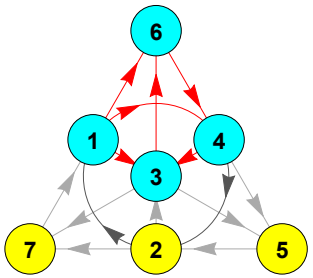
split=3

Fano plane



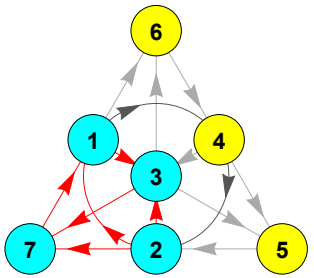
split=5

Fano plane



split=7

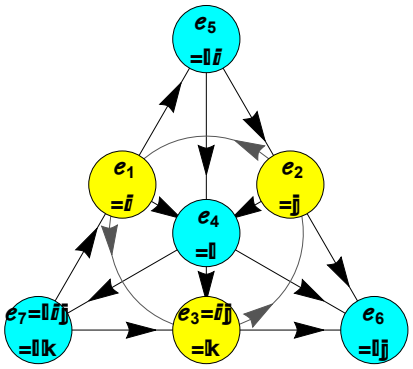
Fano plane



flip=True

{1, 3, 2}{1, 4, 6}{1, 5, 7}{2, 4, 7}{2, 6, 5}{3, 5, 4}{3, 6, 7}

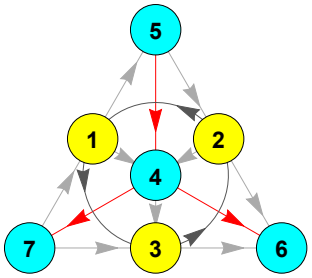
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	e_6	e_7	$-e_4$	$-e_5$
e_2	e_3	−1	$-e_1$	e_7	$-e_6$	e_5	$-e_4$
e_3	$-e_2$	e_1	−1	$-e_5$	e_4	e_7	$-e_6$
e_4	$-e_6$	$-e_7$	e_5	−1	$-e_3$	e_1	e_2
e_5	$-e_7$	e_6	$-e_4$	e_3	−1	$-e_2$	e_1
e_6	e_4	$-e_5$	$-e_7$	$-e_1$	e_2	−1	e_3
e_7	e_5	e_4	e_6	$-e_2$	$-e_1$	$-e_3$	−1

split=1

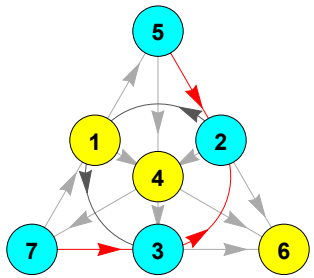
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	6	7	−4	−5
2	3	−1	−1	7	−6	5	−4
3	−2	1	−1	−5	4	7	−6
4	−6	−7	5	1	3	−1	−2
5	−7	6	−4	−3	1	2	−1
6	4	−5	−7	1	−2	1	−3
7	5	4	6	2	1	3	1

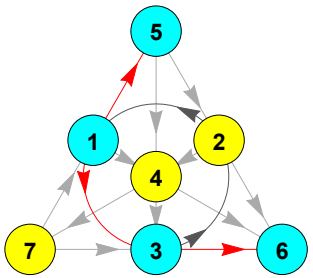
split=2

Fano plane



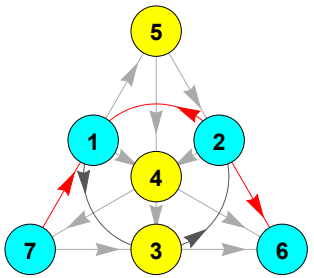
split=4

Fano plane



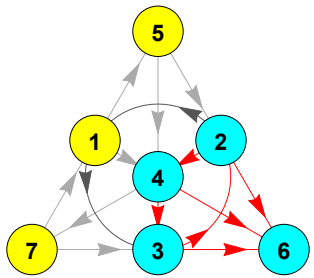
split=6

Fano plane



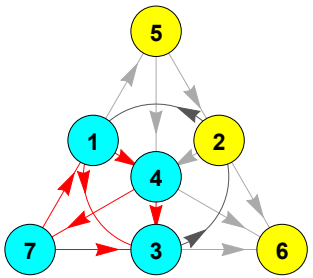
split=3

Fano plane



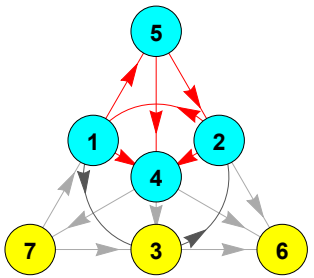
split=5

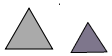
Fano plane



split=7

Fano plane

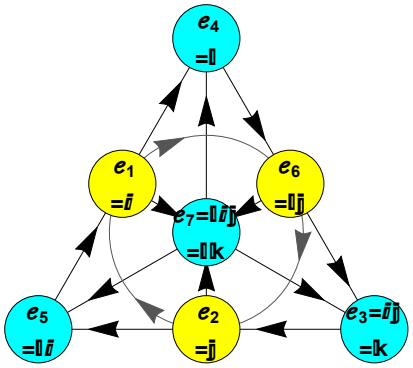


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
13	$\gamma_{\frac{5}{w_1}}^{\frac{0}{R}}$		0apggsscc 001110100_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Pm 61

flip=False

{1, 6, 2}{1, 7, 3}{1, 4, 5}{2, 5, 3}{2, 7, 4}{3, 4, 6}{5, 6, 7}

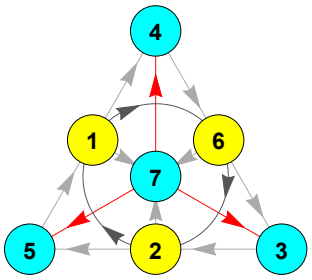
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	$-e_7$	e_5	$-e_4$	e_2	e_3
e_2	e_6	−1	$-e_5$	$-e_7$	e_3	$-e_1$	e_4	
e_3	e_7	e_5	−1	e_6	$-e_2$	$-e_4$	$-e_1$	
e_4	$-e_5$	e_7	$-e_6$	−1	e_1	e_3	$-e_2$	
e_5	e_4	$-e_3$	e_2	$-e_1$	−1	e_7	$-e_6$	
e_6	$-e_2$	e_1	e_4	$-e_3$	$-e_7$	−1	e_5	
e_7	$-e_3$	$-e_4$	e_1	e_2	e_6	$-e_5$	−1	

split=1

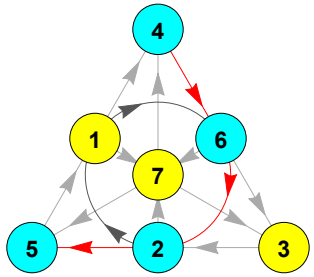
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−7	5	−4	2	3
2	6	−1	−5	−7	3	−1	4
3	7	5	1	−6	2	−4	1
4	−5	7	6	1	−1	3	2
5	4	−3	−2	1	1	7	6
6	−2	1	4	−3	−7	−1	5
7	−3	−4	−1	−2	−6	−5	1

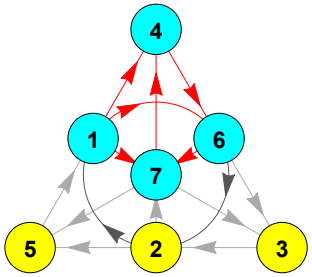
split=2

Fano plane



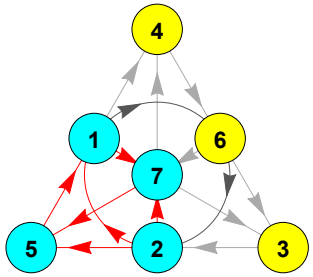
split=4

Fano plane



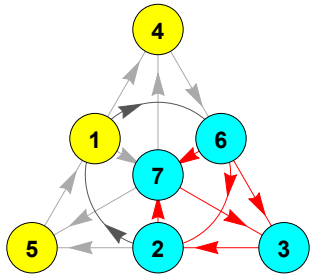
split=6

Fano plane



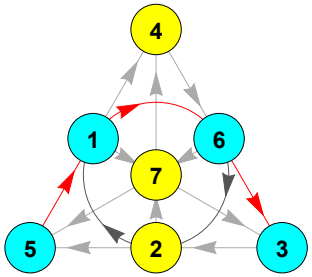
split=3

Fano plane



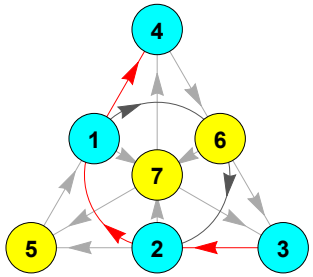
split=5

Fano plane



split=7

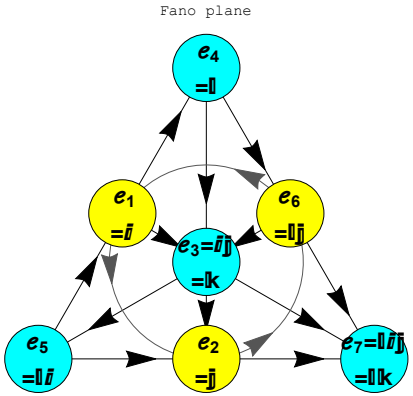
Fano plane



flip=True

{1, 2, 6}{1, 3, 7}{1, 4, 5}{2, 4, 3}{2, 7, 5}{3, 5, 6}{4, 6, 7}

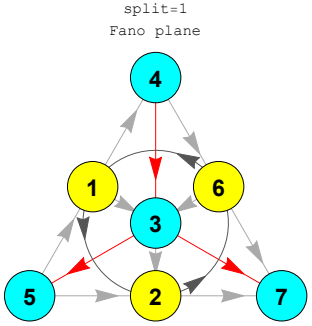
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_7	e_5	$-e_4$	$-e_2$	$-e_3$
e_2	$-e_6$	−1	$-e_4$	e_3	$-e_7$	e_1	e_5	
e_3	$-e_7$	e_4	−1	$-e_2$	e_6	$-e_5$	e_1	
e_4	$-e_5$	$-e_3$	e_2	−1	e_1	e_7	$-e_6$	
e_5	e_4	e_7	$-e_6$	$-e_1$	−1	e_3	$-e_2$	
e_6	e_2	$-e_1$	e_5	$-e_7$	$-e_3$	−1	e_4	
e_7	e_3	$-e_5$	$-e_1$	e_6	e_2	$-e_4$	−1	

split=1

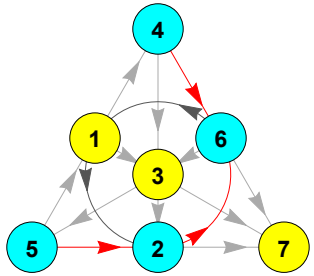
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	7	5	−4	−2	−3
2	−6	−1	−4	3	−7	1	5
3	−7	4	1	2	−6	−5	−1
4	−5	−3	−2	1	−1	7	6
5	4	7	6	1	1	3	2
6	2	−1	5	−7	−3	−1	4
7	3	−5	1	−6	−2	−4	1

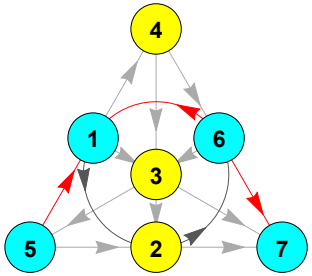
split=2

Fano plane



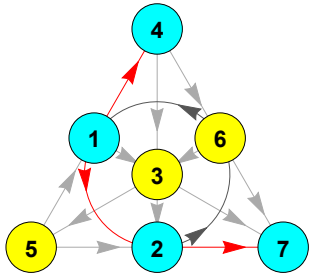
split=4

Fano plane



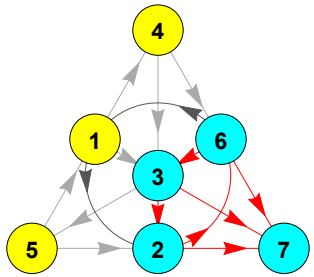
split=6

Fano plane



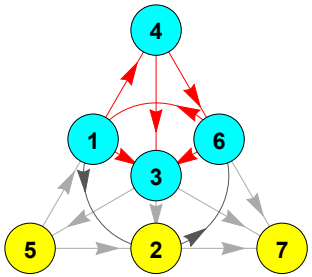
split=3

Fano plane



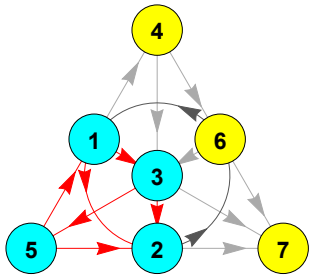
split=5

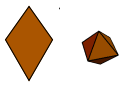
Fano plane



split=7

Fano plane

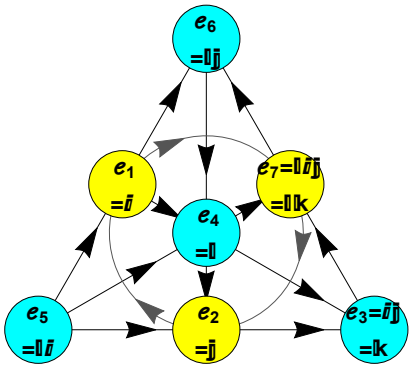


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
14	$\overline{\underset{\circ_d}{\mathrm{b}}}^{\,\mathrm{t}\mapsto 1/3}$		0apggsscc 010110001_2	Bn{ 1 0 0 0 0 1 0 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Ba 56

flip=False

{1, 7, 2}{1, 4, 3}{1, 6, 5}{2, 3, 5}{2, 6, 4}{3, 7, 6}{4, 7, 5}

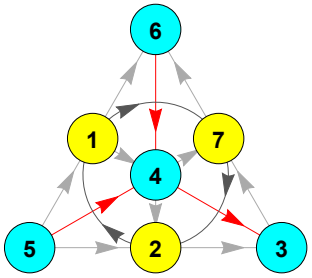
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	$-e_4$	e_3	$-e_6$	e_5	e_2
e_2	e_7	−1	e_5	$-e_6$	$-e_3$	e_4	$-e_1$	
e_3	e_4	$-e_5$	−1	$-e_1$	e_2	$-e_7$	e_6	
e_4	$-e_3$	e_6	e_1	−1	$-e_7$	$-e_2$	e_5	
e_5	e_6	e_3	$-e_2$	e_7	−1	$-e_1$	$-e_4$	
e_6	$-e_5$	$-e_4$	e_7	e_2	e_1	−1	$-e_3$	
e_7	$-e_2$	e_1	$-e_6$	$-e_5$	e_4	e_3	−1	

split=1

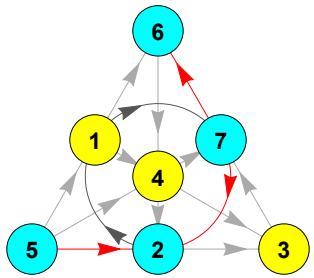
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−4	3	−6	5	2
2	7	−1	5	−6	−3	4	−1
3	4	−5	1	1	−2	7	6
4	−3	6	−1	1	7	2	5
5	6	3	2	−7	1	1	−4
6	−5	−4	−7	−2	−1	1	−3
7	−2	1	−6	−5	4	3	−1

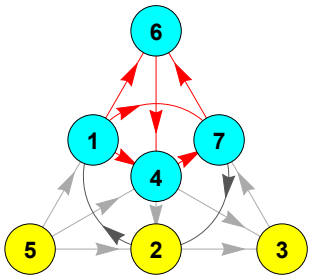
split=2

Fano plane



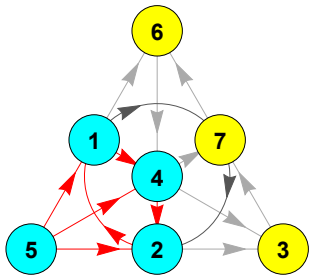
split=4

Fano plane



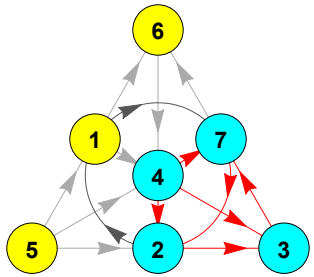
split=6

Fano plane



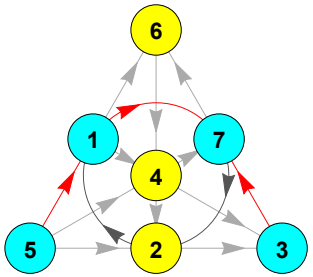
split=3

Fano plane



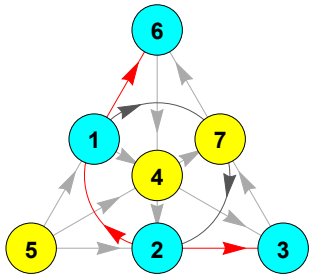
split=5

Fano plane



split=7

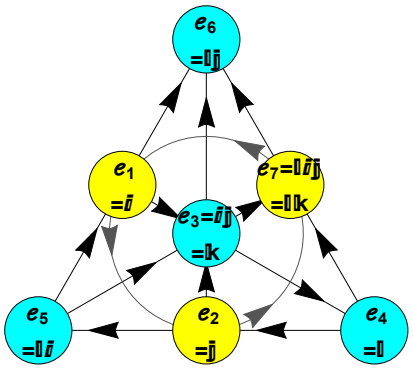
Fano plane



flip=True

{1, 2, 7}{1, 3, 4}{1, 6, 5}{2, 3, 6}{2, 5, 4}{3, 7, 5}{4, 7, 6}

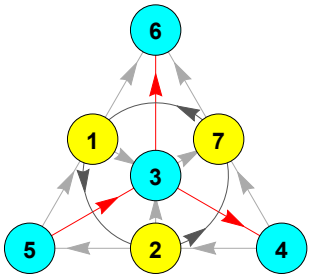
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	e_4	$-e_3$	$-e_6$	e_5	$-e_2$
e_2	$-e_7$	−1	e_6	$-e_5$	e_4	$-e_3$	e_1	
e_3	$-e_4$	$-e_6$	−1	e_1	$-e_7$	e_2	e_5	
e_4	e_3	e_5	$-e_1$	−1	$-e_2$	$-e_7$	e_6	
e_5	e_6	$-e_4$	e_7	e_2	−1	$-e_1$	$-e_3$	
e_6	$-e_5$	e_3	$-e_2$	e_7	e_1	−1	$-e_4$	
e_7	e_2	$-e_1$	$-e_5$	$-e_6$	e_3	e_4	−1	

split=1

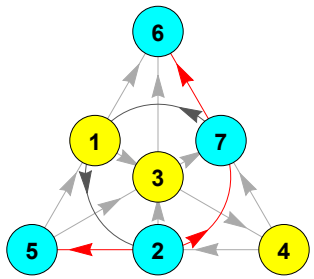
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	4	−3	−6	5	−2
2	−7	−1	6	−5	4	−3	1
3	−4	−6	1	−1	7	−2	5
4	3	5	1	1	2	7	6
5	6	−4	−7	−2	1	1	−3
6	−5	3	2	−7	−1	1	−4
7	2	−1	−5	−6	3	4	−1

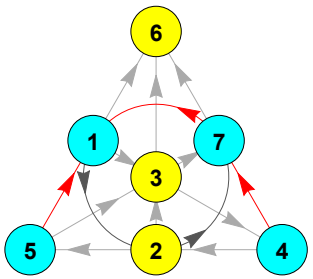
split=2

Fano plane



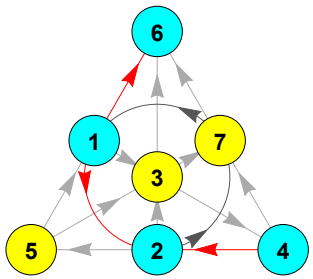
split=4

Fano plane



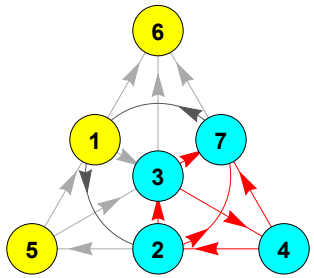
split=6

Fano plane



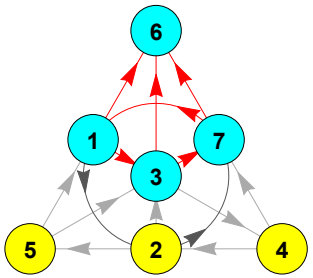
split=3

Fano plane



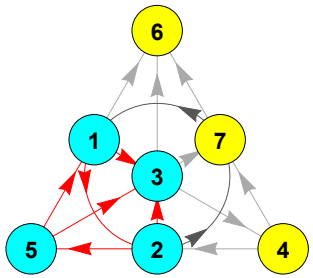
split=5

Fano plane



split=7

Fano plane

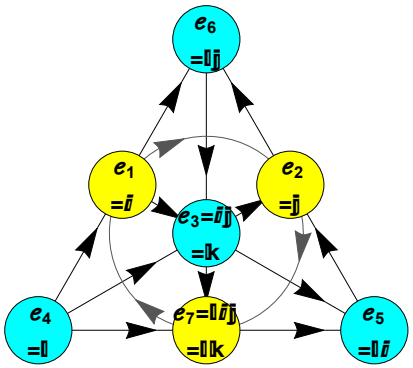


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
15	$\overline{\underset{c_d}{b}}^{\,t\to 1/3}_{\tilde{L}}$		0apggsscc 010110010_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Sn 50

flip=False

{1, 2, 7}{1, 3, 5}{1, 6, 4}{2, 4, 3}{2, 6, 5}{3, 7, 6}{4, 7, 5}

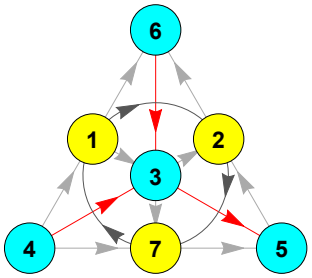
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_5	$-e_6$	$-e_3$	e_4	$-e_2$
e_2	$-e_7$	−1	$-e_4$	e_3	$-e_6$	e_5	e_1
e_3	$-e_5$	e_4	−1	$-e_2$	e_1	$-e_7$	e_6
e_4	e_6	$-e_3$	e_2	−1	$-e_7$	$-e_1$	e_5
e_5	e_3	e_6	$-e_1$	e_7	−1	$-e_2$	$-e_4$
e_6	$-e_4$	$-e_5$	e_7	e_1	e_2	−1	$-e_3$
e_7	e_2	$-e_1$	$-e_6$	$-e_5$	e_4	e_3	−1

split=1

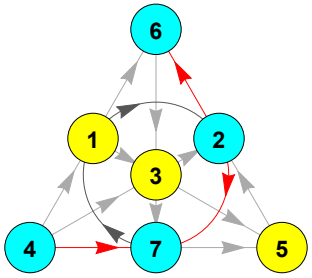
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	5	−6	−3	4	−2
2	−7	−1	−4	3	−6	5	1
3	−5	4	1	2	−1	7	6
4	6	−3	−2	1	7	1	5
5	3	6	1	−7	1	2	−4
6	−4	−5	−7	−1	−2	1	−3
7	2	−1	−6	−5	4	3	−1

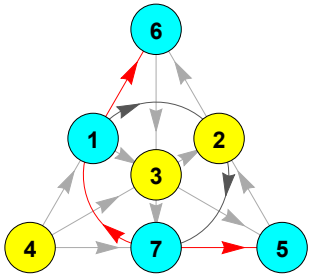
split=2

Fano plane



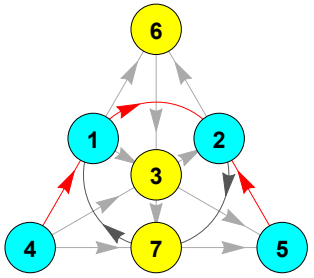
split=4

Fano plane



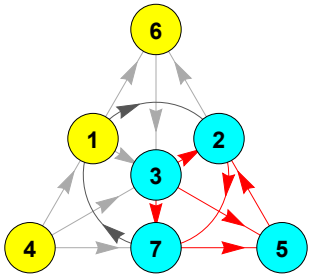
split=6

Fano plane



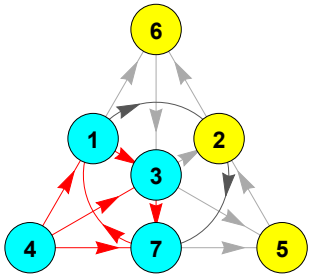
split=3

Fano plane



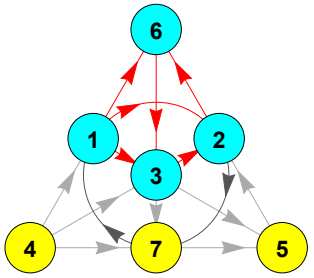
split=5

Fano plane



split=7

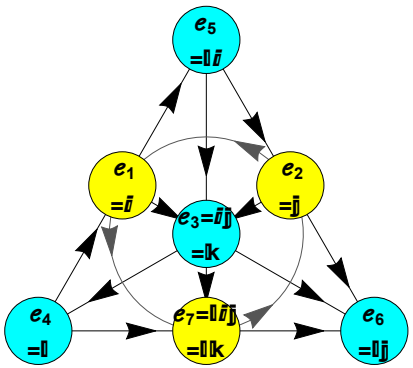
Fano plane



flip=True

{1, 7, 2}{1, 3, 6}{1, 5, 4}{2, 3, 4}{2, 6, 5}{3, 7, 5}{4, 7, 6}

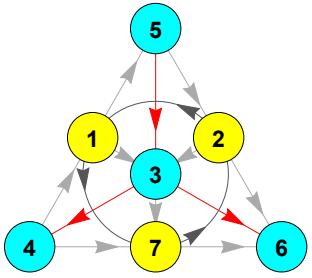
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_6	$-e_5$	e_4	$-e_3$	e_2
e_2	e_7	−1	e_4	$-e_3$	$-e_6$	e_5	$-e_1$
e_3	$-e_6$	$-e_4$	−1	e_2	$-e_7$	e_1	e_5
e_4	e_5	e_3	$-e_2$	−1	$-e_1$	$-e_7$	e_6
e_5	$-e_4$	e_6	e_7	e_1	−1	$-e_2$	$-e_3$
e_6	e_3	$-e_5$	$-e_1$	e_7	e_2	−1	$-e_4$
e_7	$-e_2$	e_1	$-e_5$	$-e_6$	e_3	e_4	−1

split=1

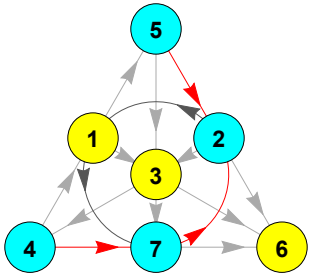
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	6	−5	4	−3	2
2	7	−1	4	−3	−6	5	−1
3	−6	−4	1	−2	7	−1	5
4	5	3	2	1	1	7	6
5	−4	6	−7	−1	1	2	−3
6	3	−5	1	−7	−2	1	−4
7	−2	1	−5	−6	3	4	−1

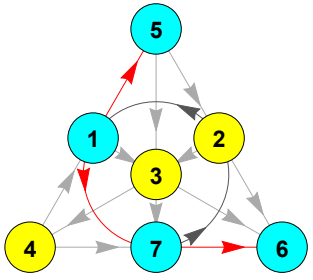
split=2

Fano plane



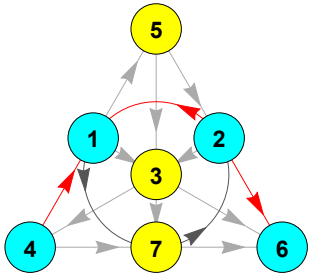
split=4

Fano plane



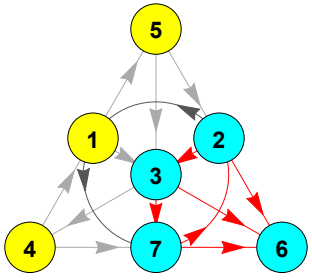
split=6

Fano plane



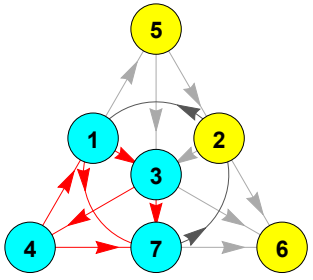
split=3

Fano plane



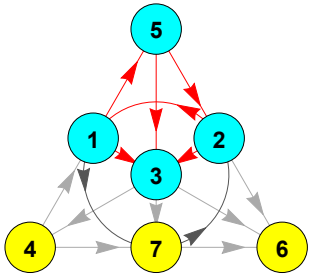
split=5

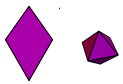
Fano plane



split=7

Fano plane

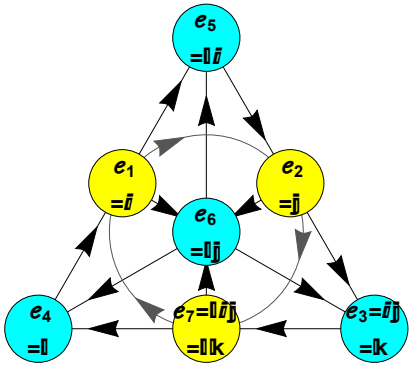


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
16	$\overline{b}_{m_d}^{1/3}$		0apggsscc 010110011_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Np}}$ 93

flip=False

{1, 2, 7}{1, 6, 3}{1, 5, 4}{2, 3, 5}{2, 6, 4}{3, 7, 4}{5, 7, 6}

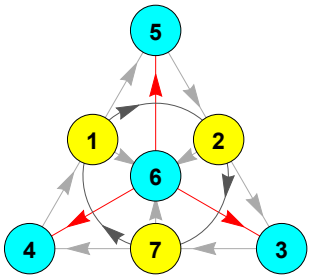
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_6$	$-e_5$	e_4	e_3	$-e_2$
e_2	$-e_7$	−1	e_5	$-e_6$	$-e_3$	e_4	e_1
e_3	e_6	$-e_5$	−1	$-e_7$	e_2	$-e_1$	e_4
e_4	e_5	e_6	e_7	−1	$-e_1$	$-e_2$	$-e_3$
e_5	$-e_4$	e_3	$-e_2$	e_1	−1	$-e_7$	e_6
e_6	$-e_3$	$-e_4$	e_1	e_2	e_7	−1	$-e_5$
e_7	e_2	$-e_1$	$-e_4$	e_3	$-e_6$	e_5	−1

split=1

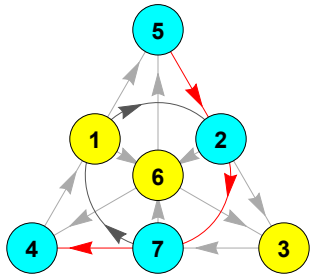
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−6	−5	4	3	−2
2	−7	−1	5	−6	−3	4	1
3	6	−5	1	7	−2	1	4
4	5	6	−7	1	1	2	−3
5	−4	3	2	−1	1	7	6
6	−3	−4	−1	−2	−7	1	−5
7	2	−1	−4	3	−6	5	−1

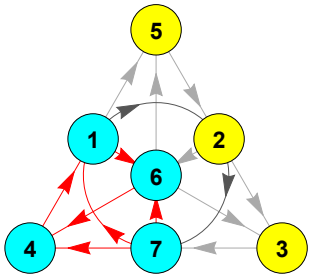
split=2

Fano plane



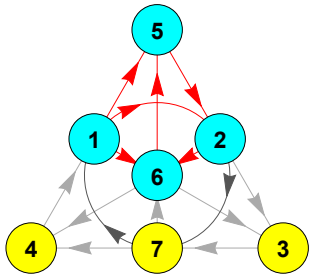
split=4

Fano plane



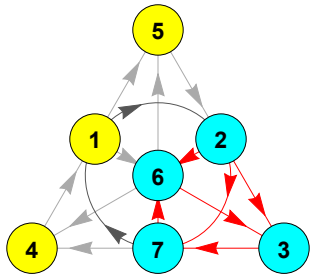
split=6

Fano plane



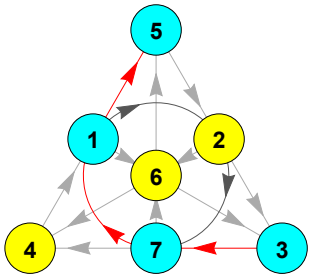
split=3

Fano plane



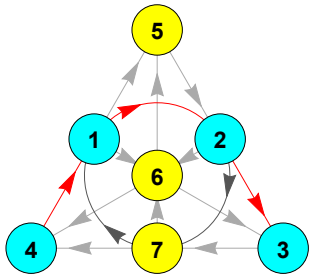
split=5

Fano plane



split=7

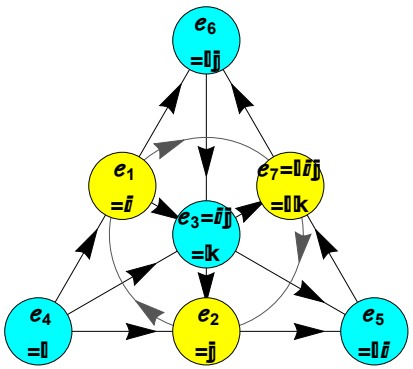
Fano plane



flip=True

{1, 7, 2}{1, 3, 5}{1, 6, 4}{2, 6, 3}{2, 5, 4}{3, 7, 4}{5, 7, 6}

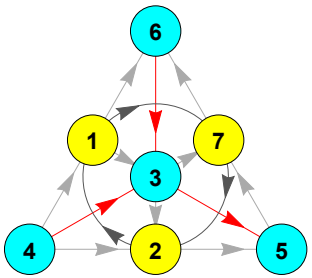
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_5	$-e_6$	$-e_3$	e_4	e_2
e_2	e_7	−1	$-e_6$	$-e_5$	e_4	e_3	$-e_1$
e_3	$-e_5$	e_6	−1	$-e_7$	e_1	$-e_2$	e_4
e_4	e_6	e_5	e_7	−1	$-e_2$	$-e_1$	$-e_3$
e_5	e_3	$-e_4$	$-e_1$	e_2	−1	$-e_7$	e_6
e_6	$-e_4$	$-e_3$	e_2	e_1	e_7	−1	$-e_5$
e_7	$-e_2$	e_1	$-e_4$	e_3	$-e_6$	e_5	−1

split=1

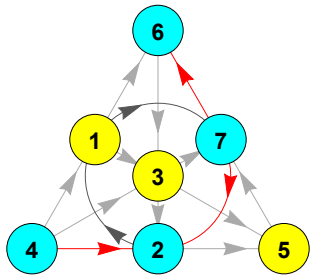
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	5	−6	−3	4	2
2	7	−1	−6	−5	4	3	−1
3	−5	6	1	7	−1	2	4
4	6	5	−7	1	2	1	−3
5	3	−4	1	−2	1	7	6
6	−4	−3	−2	−1	−7	1	−5
7	−2	1	−4	3	−6	5	−1

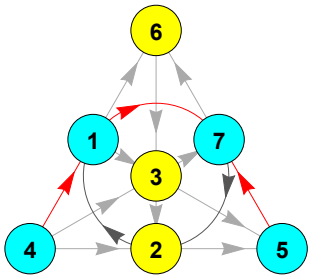
split=2

Fano plane



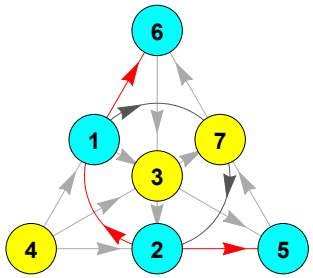
split=4

Fano plane



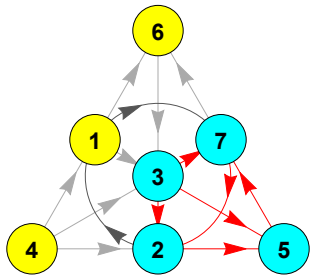
split=6

Fano plane



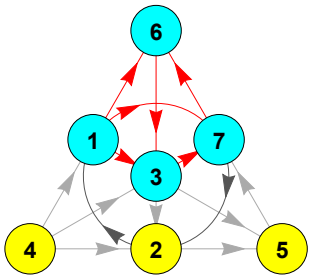
split=3

Fano plane



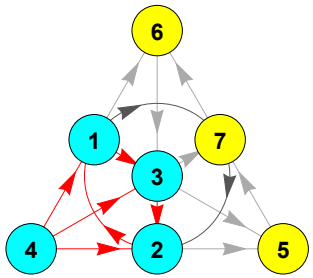
split=5

Fano plane



split=7

Fano plane

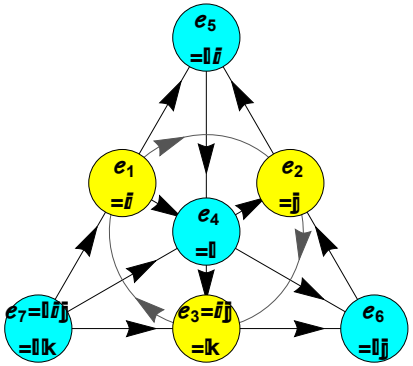


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
17	ν_e ν_m ν_t		0apggsscc 001011000_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Tb 65

flip=False

{1, 2, 3}{1, 4, 6}{1, 5, 7}{2, 7, 4}{2, 5, 6}{3, 5, 4}{3, 6, 7}

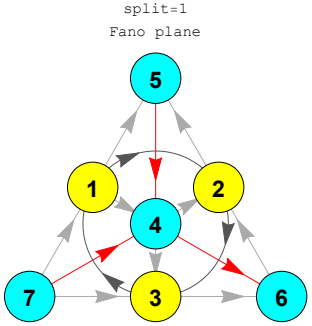
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	e_6	e_7	$-e_4$	$-e_5$
e_2	$-e_3$	−1	e_1	$-e_7$	e_6	$-e_5$	e_4
e_3	e_2	$-e_1$	−1	$-e_5$	e_4	e_7	$-e_6$
e_4	$-e_6$	e_7	e_5	−1	$-e_3$	e_1	$-e_2$
e_5	$-e_7$	$-e_6$	$-e_4$	e_3	−1	e_2	e_1
e_6	e_4	e_5	$-e_7$	$-e_1$	$-e_2$	−1	e_3
e_7	e_5	$-e_4$	e_6	e_2	$-e_1$	$-e_3$	−1

split=1

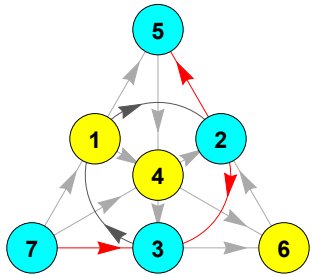
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	6	7	−4	−5
2	−3	−1	1	−7	6	−5	4
3	2	−1	−1	−5	4	7	−6
4	−6	7	5	1	3	−1	2
5	−7	−6	−4	−3	1	−2	−1
6	4	5	−7	1	2	1	−3
7	5	−4	6	−2	1	3	1

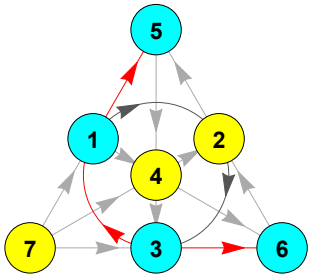
split=2

Fano plane



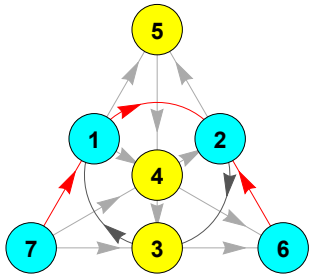
split=4

Fano plane



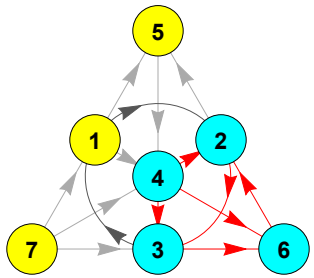
split=6

Fano plane



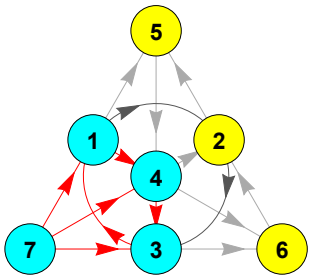
split=3

Fano plane



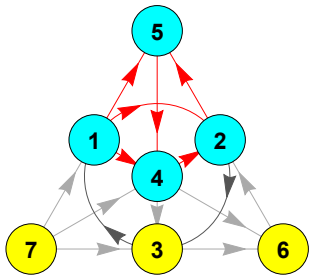
split=5

Fano plane



split=7

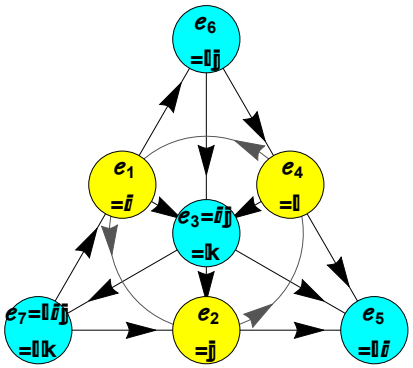
Fano plane



flip=True

{1, 2, 4}{1, 3, 5}{1, 6, 7}{2, 6, 3}{2, 5, 7}{3, 7, 4}{4, 5, 6}

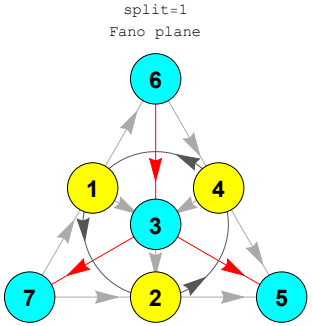
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_5	$-e_2$	$-e_3$	e_7	$-e_6$
e_2	$-e_4$	−1	$-e_6$	e_1	e_7	e_3	$-e_5$
e_3	$-e_5$	e_6	−1	$-e_7$	e_1	$-e_2$	e_4
e_4	e_2	$-e_1$	e_7	−1	e_6	$-e_5$	$-e_3$
e_5	e_3	$-e_7$	$-e_1$	$-e_6$	−1	e_4	e_2
e_6	$-e_7$	$-e_3$	e_2	e_5	$-e_4$	−1	e_1
e_7	e_6	e_5	$-e_4$	e_3	$-e_2$	$-e_1$	−1

split=1

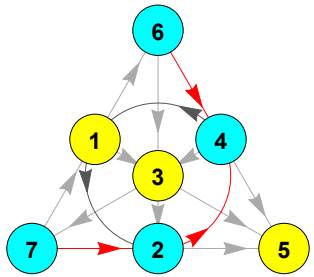
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	5	−2	−3	7	−6
2	−4	−1	−6	1	7	3	−5
3	−5	6	1	−7	−1	2	−4
4	2	−1	7	−1	6	−5	−3
5	3	−7	1	−6	1	−4	−2
6	−7	−3	−2	5	4	1	−1
7	6	5	4	3	2	1	1

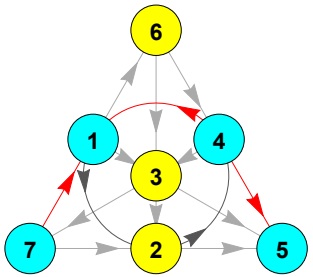
split=2

Fano plane



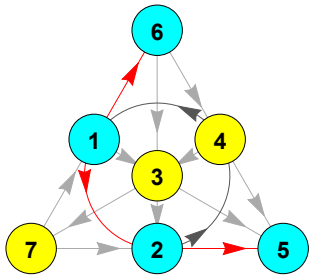
split=4

Fano plane



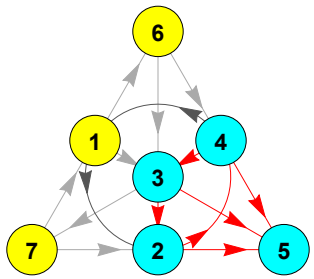
split=6

Fano plane



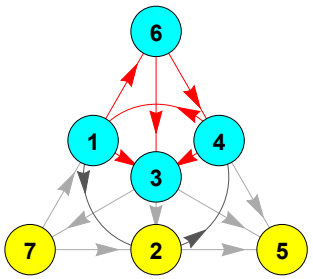
split=3

Fano plane



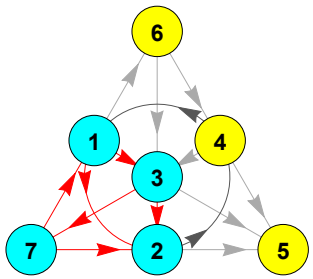
split=5

Fano plane



split=7

Fano plane

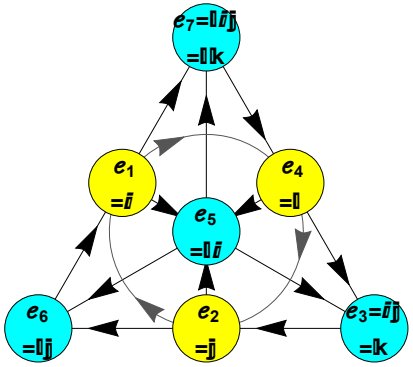


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
18	e_{ym}		0apggsscc 000011000$_2$	Bn{ 0 1 0 1 0 0 0 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Pr 59

flip=False

{1, 4, 2}{1, 5, 3}{1, 7, 6}{2, 6, 3}{2, 5, 7}{3, 7, 4}{4, 5, 6}

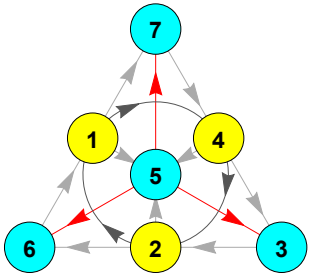
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	$-e_5$	e_2	e_3	$-e_7$	e_6
e_2	e_2	$-e_4$	−1	$-e_6$	$-e_1$	e_7	e_3	$-e_5$
e_3	e_3	e_5	e_6	−1	$-e_7$	$-e_1$	$-e_2$	e_4
e_4	e_4	$-e_2$	e_1	e_7	−1	e_6	$-e_5$	$-e_3$
e_5	e_5	$-e_3$	$-e_7$	e_1	$-e_6$	−1	e_4	e_2
e_6	e_6	e_7	$-e_3$	e_2	e_5	$-e_4$	−1	$-e_1$
e_7	e_7	$-e_6$	e_5	$-e_4$	e_3	$-e_2$	e_1	−1

split=1

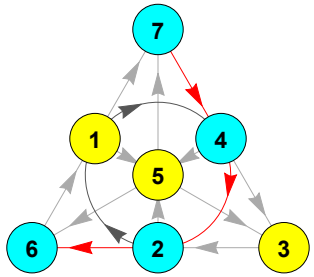
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−5	2	3	−7	6
2	4	−1	−6	−1	7	3	−5
3	5	6	1	−7	1	2	−4
4	−2	1	7	−1	6	−5	−3
5	−3	−7	−1	−6	1	−4	−2
6	7	−3	−2	5	4	1	1
7	−6	5	4	3	2	−1	1

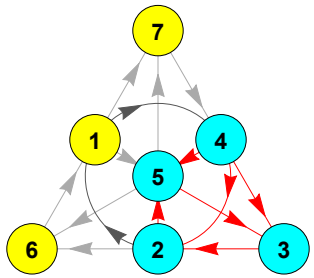
split=2

Fano plane



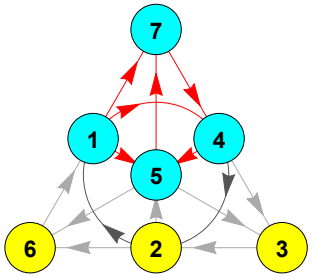
split=3

Fano plane



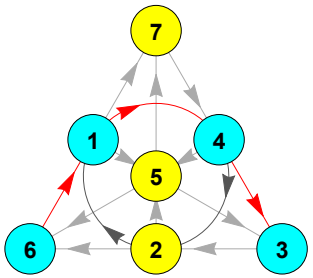
split=4

Fano plane



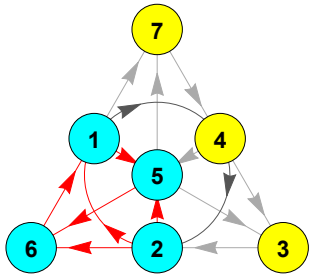
split=5

Fano plane



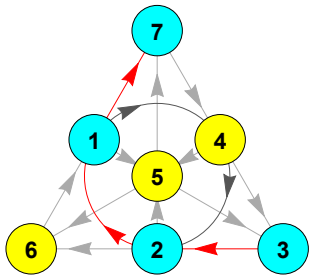
split=6

Fano plane



split=7

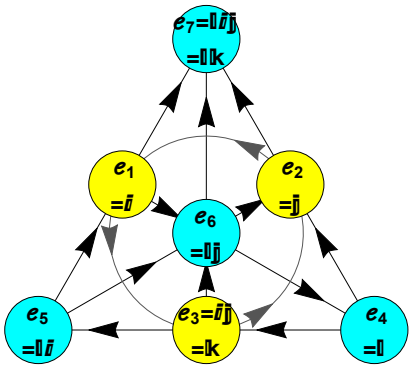
Fano plane



flip=True

{1, 3, 2}{1, 6, 4}{1, 7, 5}{2, 7, 4}{2, 5, 6}{3, 5, 4}{3, 6, 7}

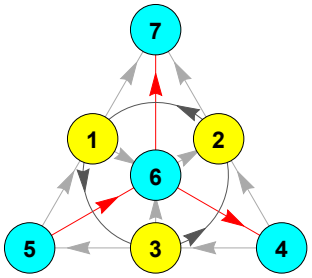
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_3$	e_2	$-e_6$	$-e_7$	e_4	e_5
e_2	e_2	e_3	−1	$-e_1$	$-e_7$	e_6	$-e_5$	e_4
e_3	e_3	$-e_2$	e_1	−1	$-e_5$	e_4	e_7	$-e_6$
e_4	e_4	e_6	e_7	e_5	−1	$-e_3$	$-e_1$	$-e_2$
e_5	e_5	e_7	$-e_6$	$-e_4$	e_3	−1	e_2	$-e_1$
e_6	e_6	$-e_4$	e_5	$-e_7$	e_1	$-e_2$	−1	e_3
e_7	e_7	$-e_5$	$-e_4$	e_6	e_2	e_1	$-e_3$	−1

split=1

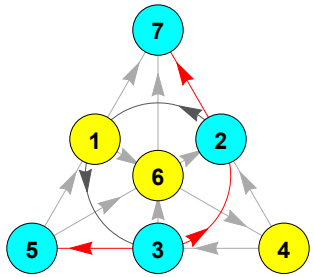
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−6	−7	4	5
2	3	−1	−1	−7	6	−5	4
3	−2	1	−1	−5	4	7	−6
4	6	7	5	1	3	1	2
5	7	−6	−4	−3	1	−2	1
6	−4	5	−7	−1	2	1	−3
7	−5	−4	6	−2	−1	3	1

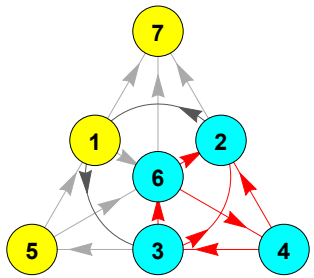
split=2

Fano plane



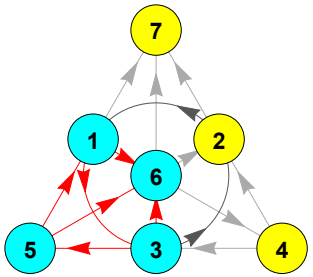
split=3

Fano plane



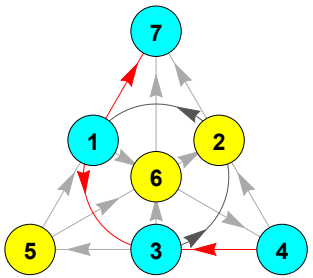
split=4

Fano plane



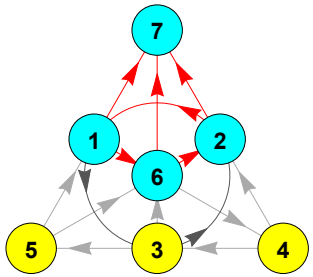
split=5

Fano plane



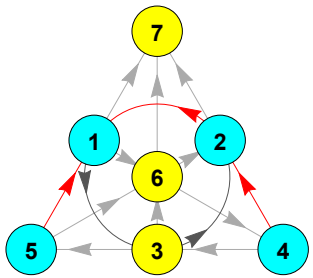
split=6

Fano plane



split=7

Fano plane

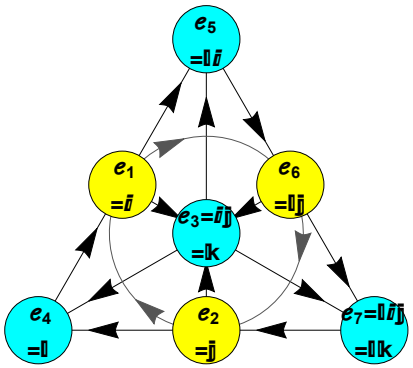


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
19	ν_τ 0 w_d L		0apggsscc 001110000_2	Bn{ 0 1 0 0 1 0 0 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	I 53

flip=False

{1, 6, 2}{1, 3, 7}{1, 5, 4}{2, 3, 5}{2, 4, 7}{3, 4, 6}{5, 6, 7}

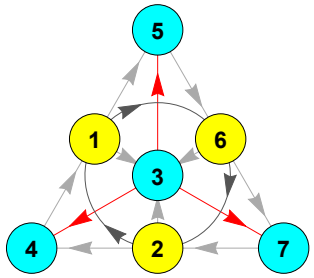
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	e_7	$-e_5$	e_4	e_2	$-e_3$
e_2	e_6	−1	e_5	e_7	$-e_3$	$-e_1$	$-e_4$
e_3	$-e_7$	$-e_5$	−1	e_6	e_2	$-e_4$	e_1
e_4	e_5	$-e_7$	$-e_6$	−1	$-e_1$	e_3	e_2
e_5	$-e_4$	e_3	$-e_2$	e_1	−1	e_7	$-e_6$
e_6	$-e_2$	e_1	e_4	$-e_3$	$-e_7$	−1	e_5
e_7	e_3	e_4	$-e_1$	$-e_2$	e_6	$-e_5$	−1

split=1

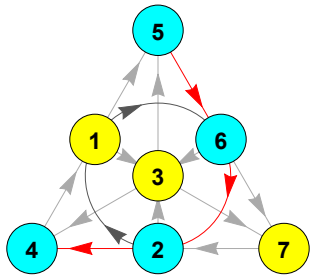
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	7	−5	4	2	−3
2	6	−1	5	7	−3	−1	−4
3	−7	−5	1	−6	−2	−4	−1
4	5	−7	6	1	1	3	−2
5	−4	3	2	−1	1	7	6
6	−2	1	4	−3	−7	−1	5
7	3	4	1	2	−6	−5	1

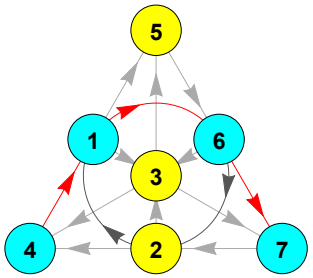
split=2

Fano plane



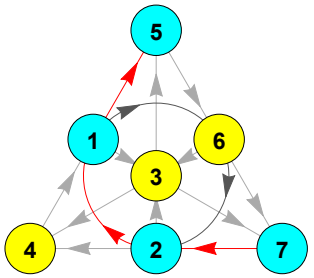
split=4

Fano plane



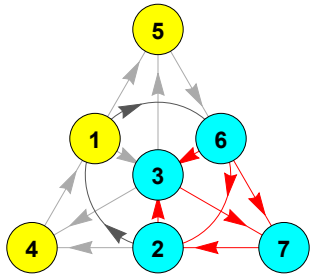
split=6

Fano plane



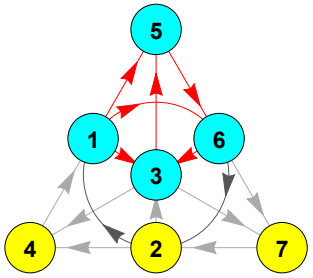
split=3

Fano plane



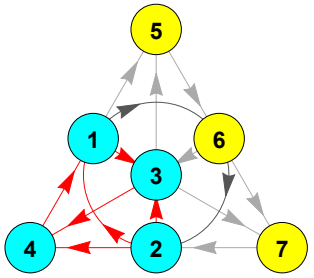
split=5

Fano plane



split=7

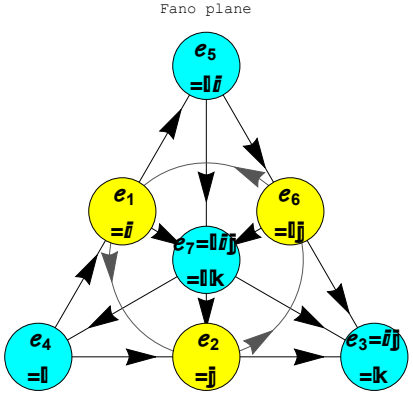
Fano plane



flip=True

{1, 2, 6}{1, 7, 3}{1, 5, 4}{2, 3, 4}{2, 5, 7}{3, 5, 6}{4, 6, 7}

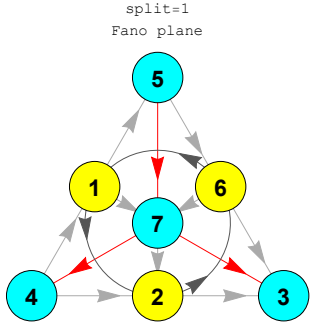
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_7$	$-e_5$	e_4	$-e_2$	e_3
e_2	$-e_6$	−1	e_4	$-e_3$	e_7	e_1	$-e_5$
e_3	e_7	$-e_4$	−1	e_2	e_6	$-e_5$	$-e_1$
e_4	e_5	e_3	$-e_2$	−1	$-e_1$	e_7	$-e_6$
e_5	$-e_4$	$-e_7$	$-e_6$	e_1	−1	e_3	e_2
e_6	e_2	$-e_1$	e_5	$-e_7$	$-e_3$	−1	e_4
e_7	$-e_3$	e_5	e_1	e_6	$-e_2$	$-e_4$	−1

split=1

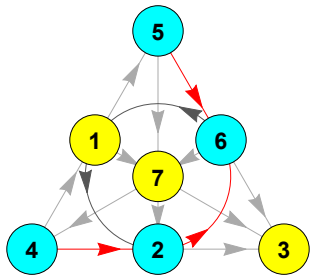
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−7	−5	4	−2	3
2	−6	−1	4	−3	7	1	−5
3	7	−4	1	−2	−6	−5	1
4	5	3	2	1	1	7	6
5	−4	−7	6	−1	1	3	−2
6	2	−1	5	−7	−3	−1	4
7	−3	5	−1	−6	2	−4	1

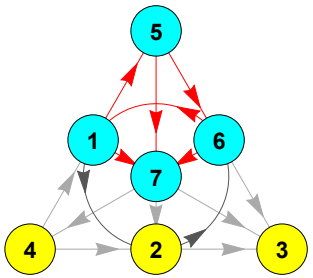
split=2

Fano plane



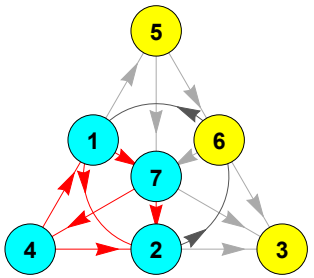
split=4

Fano plane



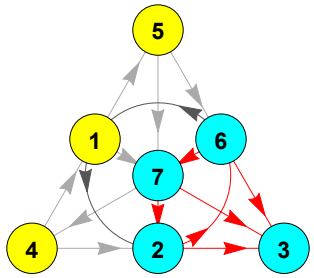
split=6

Fano plane



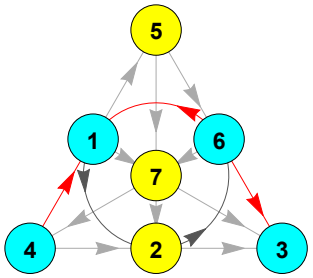
split=3

Fano plane



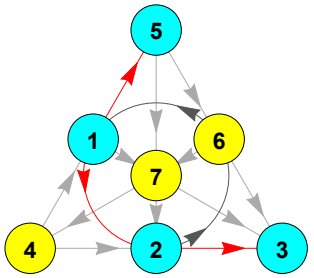
split=5

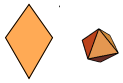
Fano plane



split=7

Fano plane

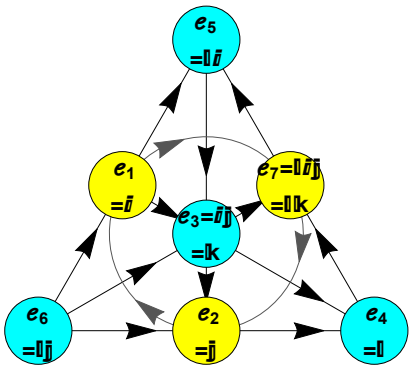


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
20	$\overline{b}_{o_1}^{\mapsto 1/3}$		0apggsscc 010110101_2	Bn{ 0 1 0 0 0 1 0 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Cd 48

flip=False

{1, 7, 2}{1, 3, 4}{1, 5, 6}{2, 5, 3}{2, 4, 6}{3, 7, 6}{4, 7, 5}

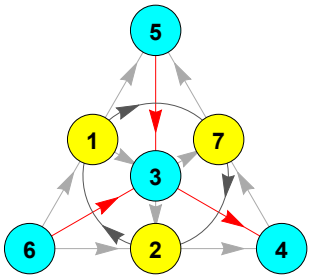
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_7$	e_4	$-e_3$	e_6	$-e_5$	e_2
e_2	e_7	-1	$-e_5$	e_6	e_3	$-e_4$	$-e_1$
e_3	$-e_4$	e_5	-1	e_1	$-e_2$	$-e_7$	e_6
e_4	e_3	$-e_6$	$-e_1$	-1	$-e_7$	e_2	e_5
e_5	$-e_6$	$-e_3$	e_2	e_7	-1	e_1	$-e_4$
e_6	e_5	e_4	e_7	$-e_2$	$-e_1$	-1	$-e_3$
e_7	$-e_2$	e_1	$-e_6$	$-e_5$	e_4	e_3	-1

split=1

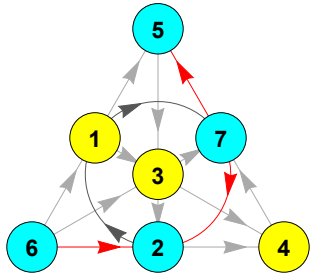
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-7	4	-3	6	-5	2
2	7	-1	-5	6	3	-4	-1
3	-4	5	1	-1	2	7	6
4	3	-6	1	1	7	-2	5
5	-6	-3	-2	-7	1	-1	-4
6	5	4	-7	2	1	1	-3
7	-2	1	-6	-5	4	3	-1

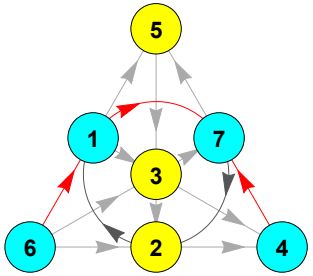
split=2

Fano plane



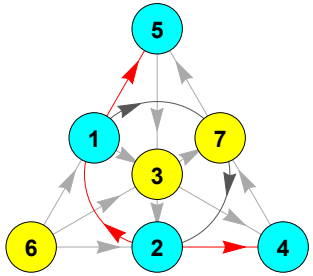
split=4

Fano plane



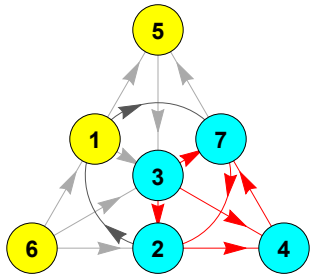
split=6

Fano plane



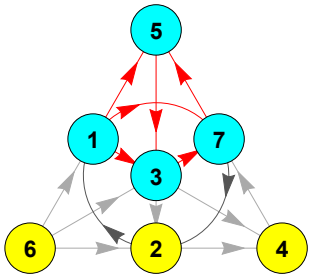
split=3

Fano plane



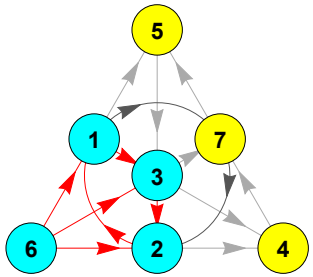
split=5

Fano plane



split=7

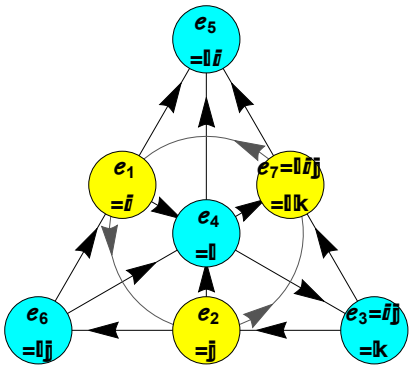
Fano plane



flip=True

{1, 2, 7}{1, 4, 3}{1, 5, 6}{2, 6, 3}{2, 4, 5}{3, 7, 5}{4, 7, 6}

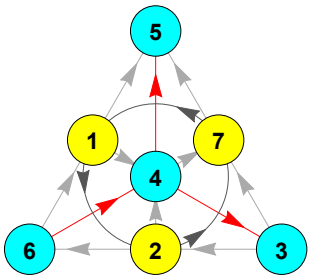
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_7	$-e_4$	e_3	e_6	$-e_5$	$-e_2$
e_2	$-e_7$	-1	$-e_6$	e_5	$-e_4$	e_3	e_1
e_3	e_4	e_6	-1	$-e_1$	$-e_7$	$-e_2$	e_5
e_4	$-e_3$	$-e_5$	e_1	-1	e_2	$-e_7$	e_6
e_5	$-e_6$	e_4	e_7	$-e_2$	-1	e_1	$-e_3$
e_6	e_5	$-e_3$	e_2	e_7	$-e_1$	-1	$-e_4$
e_7	e_2	$-e_1$	$-e_5$	$-e_6$	e_3	e_4	-1

split=1

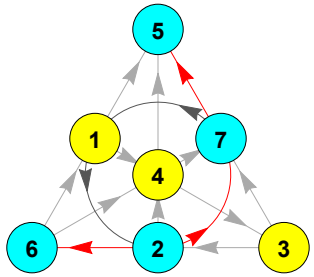
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	7	-4	3	6	-5	-2
2	-7	-1	-6	5	-4	3	1
3	4	6	1	1	7	2	5
4	-3	-5	-1	1	-2	7	6
5	-6	4	-7	2	1	-1	-3
6	5	-3	-2	-7	1	1	-4
7	2	-1	-5	-6	3	4	-1

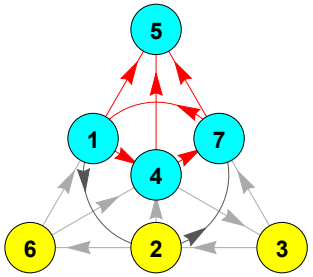
split=2

Fano plane



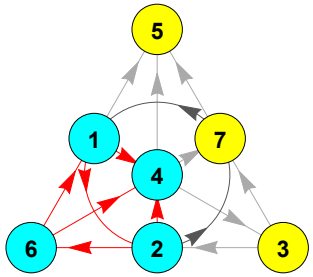
split=4

Fano plane



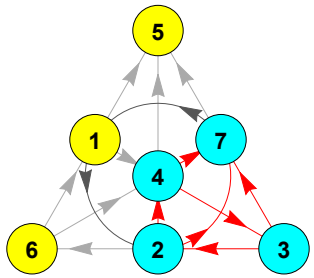
split=6

Fano plane



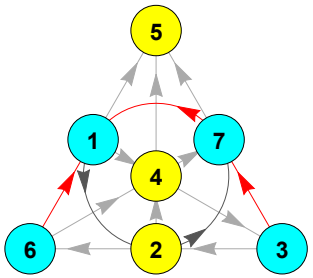
split=3

Fano plane



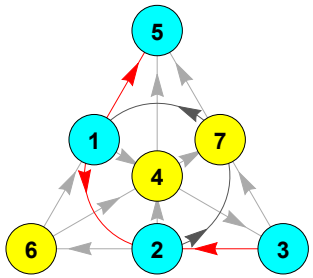
split=5

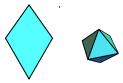
Fano plane



split=7

Fano plane

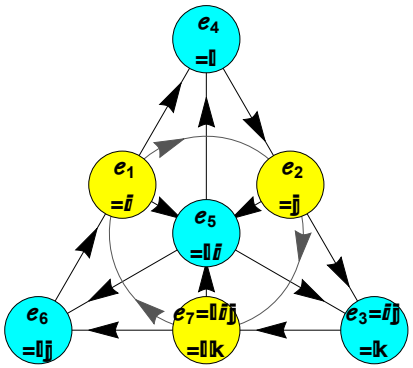


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
21	$\overline{b}_{c_1}^{\overset{\uparrow\to 1/3}{\mathring{R}}}$		0apggsscc 0101101110_2	Bn{ 0 1 0 0 0 0 1 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Nb 41

flip=False

{1, 2, 7}{1, 5, 3}{1, 4, 6}{2, 3, 4}{2, 5, 6}{3, 7, 6}{4, 7, 5}

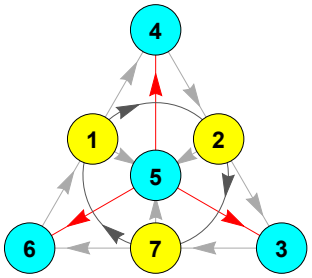
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_5$	e_6	e_3	$-e_4$	$-e_2$
e_2	$-e_7$	−1	e_4	$-e_3$	e_6	$-e_5$	e_1
e_3	e_5	$-e_4$	−1	e_2	$-e_1$	$-e_7$	e_6
e_4	$-e_6$	e_3	$-e_2$	−1	$-e_7$	e_1	e_5
e_5	$-e_3$	$-e_6$	e_1	e_7	−1	e_2	$-e_4$
e_6	e_4	e_5	e_7	$-e_1$	$-e_2$	−1	$-e_3$
e_7	e_2	$-e_1$	$-e_6$	$-e_5$	e_4	e_3	−1

split=1

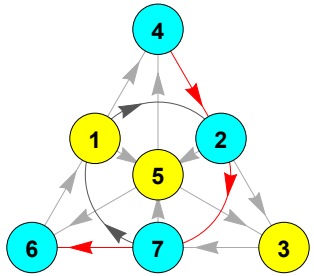
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−5	6	3	−4	−2
2	−7	−1	4	−3	6	−5	1
3	5	−4	1	−2	1	7	6
4	−6	3	2	1	7	−1	5
5	−3	−6	−1	−7	1	−2	−4
6	4	5	−7	1	2	1	−3
7	2	−1	−6	−5	4	3	−1

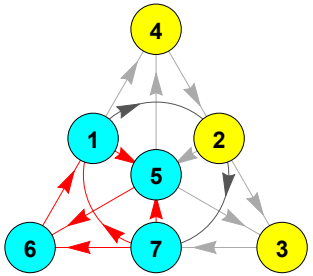
split=2

Fano plane



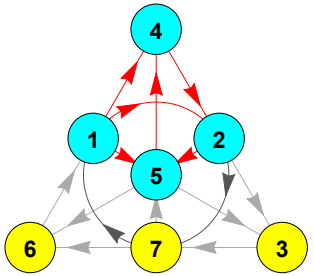
split=4

Fano plane



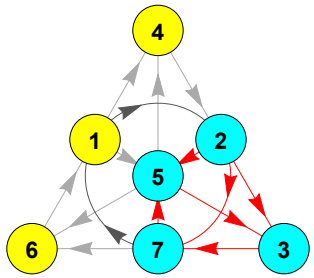
split=6

Fano plane



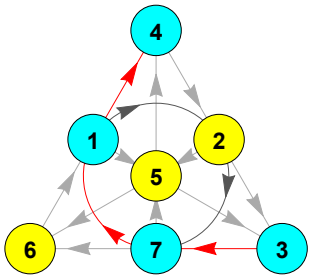
split=3

Fano plane



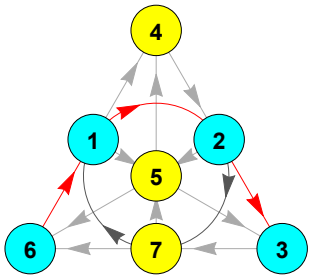
split=5

Fano plane



split=7

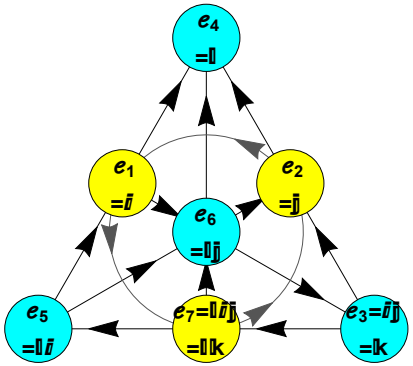
Fano plane



flip=True

{1, 7, 2}{1, 6, 3}{1, 4, 5}{2, 4, 3}{2, 5, 6}{3, 7, 5}{4, 7, 6}

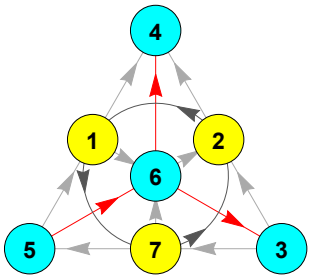
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_6$	e_5	$-e_4$	e_3	e_2
e_2	e_7	−1	$-e_4$	e_3	e_6	$-e_5$	$-e_1$
e_3	e_6	e_4	−1	$-e_2$	$-e_7$	$-e_1$	e_5
e_4	$-e_5$	$-e_3$	e_2	−1	e_1	$-e_7$	e_6
e_5	e_4	$-e_6$	e_7	$-e_1$	−1	e_2	$-e_3$
e_6	$-e_3$	e_5	e_1	e_7	$-e_2$	−1	$-e_4$
e_7	$-e_2$	e_1	$-e_5$	$-e_6$	e_3	e_4	−1

split=1

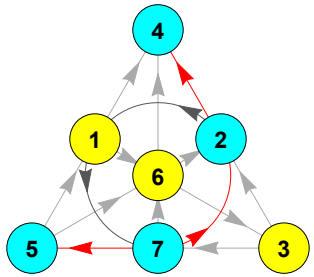
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−6	5	−4	3	2
2	7	−1	−4	3	6	−5	−1
3	6	4	1	2	7	1	5
4	−5	−3	−2	1	−1	7	6
5	4	−6	−7	1	1	−2	−3
6	−3	5	−1	−7	2	1	−4
7	−2	1	−5	−6	3	4	−1

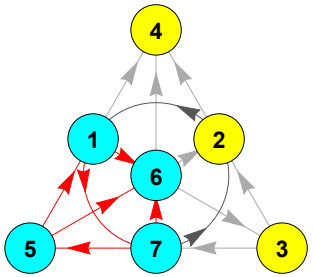
split=2

Fano plane



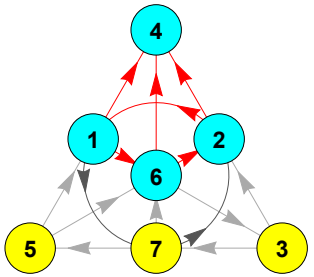
split=4

Fano plane



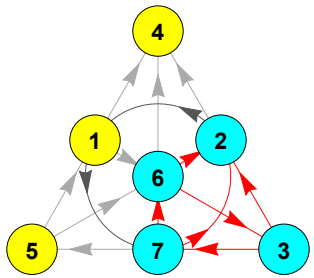
split=6

Fano plane



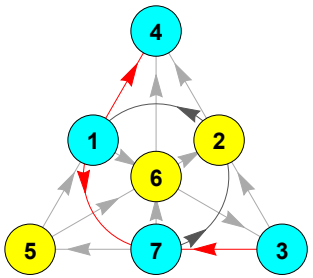
split=3

Fano plane



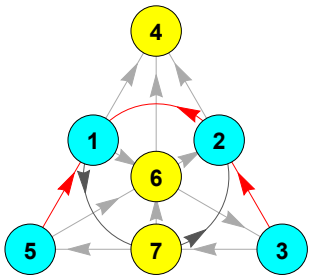
split=5

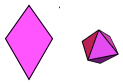
Fano plane



split=7

Fano plane

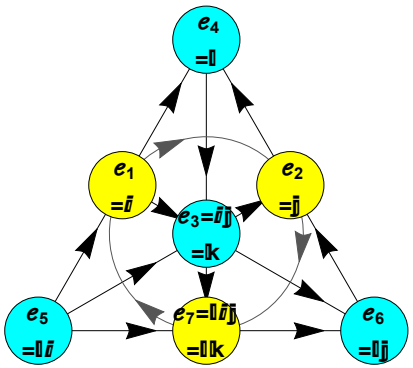


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
22	$\overline{b}_{m_1}^{1/3}{}_R$		0apggsscc 010110111_2	Bn{ 0 1 0 0 0 0 0 1 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Cf}$ 98

flip=False

{1, 2, 7}{1, 3, 6}{1, 4, 5}{2, 5, 3}{2, 4, 6}{3, 7, 4}{5, 7, 6}

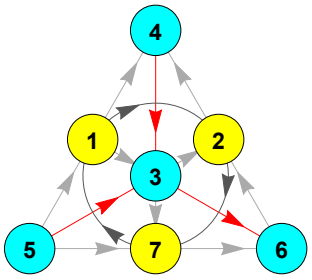
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_6	e_5	$-e_4$	$-e_3$	$-e_2$
e_2	$-e_7$	−1	$-e_5$	e_6	e_3	$-e_4$	e_1
e_3	$-e_6$	e_5	−1	$-e_7$	$-e_2$	e_1	e_4
e_4	$-e_5$	$-e_6$	e_7	−1	e_1	e_2	$-e_3$
e_5	e_4	$-e_3$	e_2	$-e_1$	−1	$-e_7$	e_6
e_6	e_3	e_4	$-e_1$	$-e_2$	e_7	−1	$-e_5$
e_7	e_2	$-e_1$	$-e_4$	e_3	$-e_6$	e_5	−1

split=1

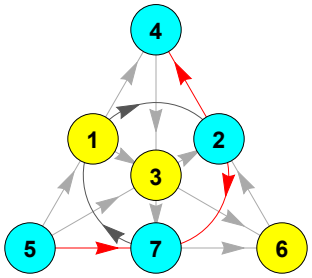
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	6	5	−4	−3	−2
2	−7	−1	−5	6	3	−4	1
3	−6	5	1	7	2	−1	4
4	−5	−6	−7	1	−1	−2	−3
5	4	−3	−2	1	1	7	6
6	3	4	1	2	−7	1	−5
7	2	−1	−4	3	−6	5	−1

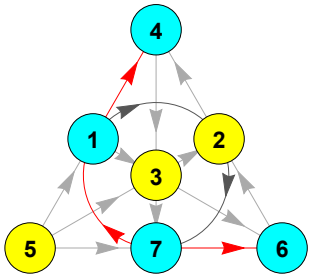
split=2

Fano plane



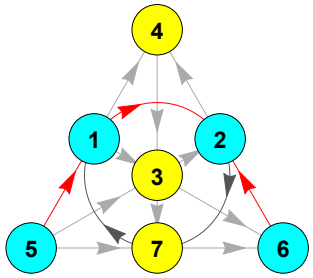
split=4

Fano plane



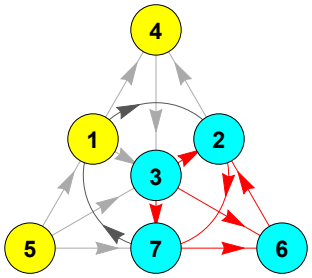
split=6

Fano plane



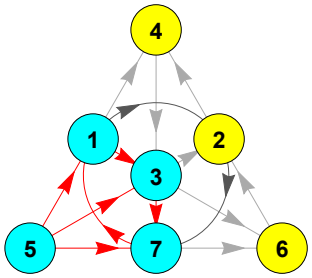
split=3

Fano plane



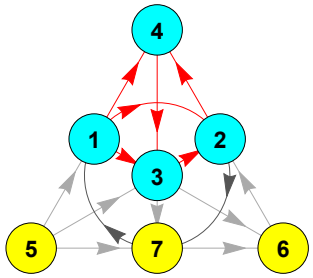
split=5

Fano plane



split=7

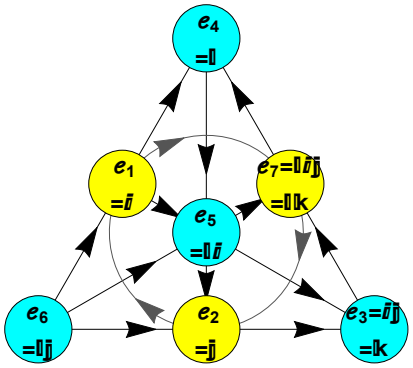
Fano plane



flip=True

{1, 7, 2}{1, 5, 3}{1, 4, 6}{2, 3, 6}{2, 4, 5}{3, 7, 4}{5, 7, 6}

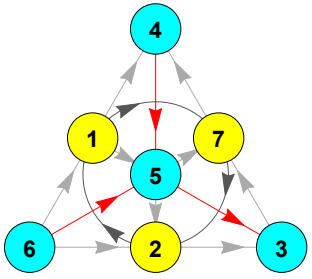
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_5$	e_6	e_3	$-e_4$	e_2
e_2	e_7	−1	e_6	e_5	$-e_4$	$-e_3$	$-e_1$
e_3	e_5	$-e_6$	−1	$-e_7$	$-e_1$	e_2	e_4
e_4	$-e_6$	$-e_5$	e_7	−1	e_2	e_1	$-e_3$
e_5	$-e_3$	e_4	e_1	$-e_2$	−1	$-e_7$	e_6
e_6	e_4	e_3	$-e_2$	$-e_1$	e_7	−1	$-e_5$
e_7	$-e_2$	e_1	$-e_4$	e_3	$-e_6$	e_5	−1

split=1

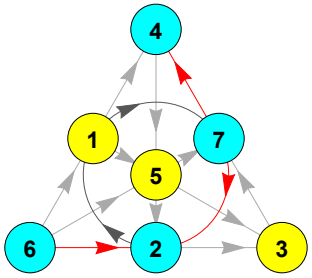
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−5	6	3	−4	2
2	7	−1	6	5	−4	−3	−1
3	5	−6	1	7	1	−2	4
4	−6	−5	−7	1	−2	−1	−3
5	−3	4	−1	2	1	7	6
6	4	3	2	1	−7	1	−5
7	−2	1	−4	3	−6	5	−1

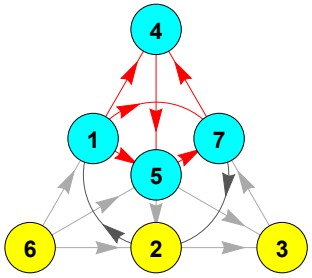
split=2

Fano plane



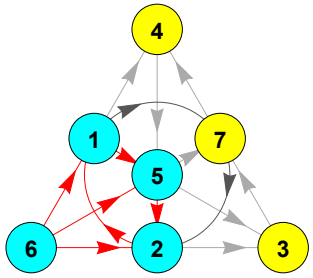
split=4

Fano plane



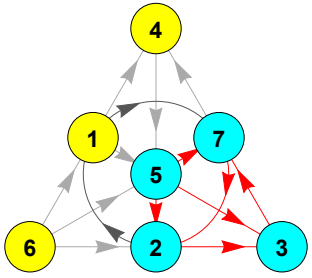
split=6

Fano plane



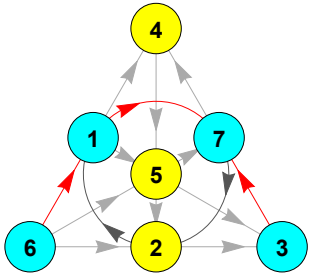
split=3

Fano plane



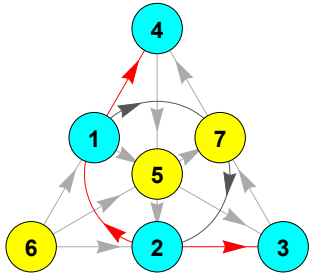
split=5

Fano plane



split=7

Fano plane

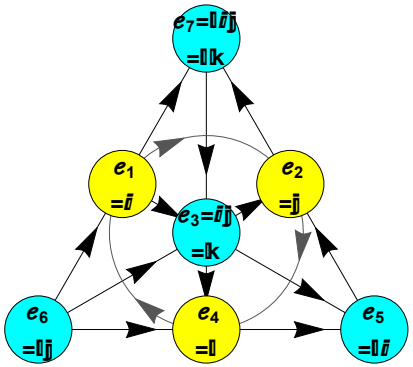


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
23	$e_{y_1}^{-}$	△ ▲	0apggsscc 000010100_2	Bn{ 0 0 1 1 0 0 0 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Te 52

flip=False

{1, 2, 4}{1, 3, 5}{1, 7, 6}{2, 6, 3}{2, 7, 5}{3, 4, 7}{4, 5, 6}

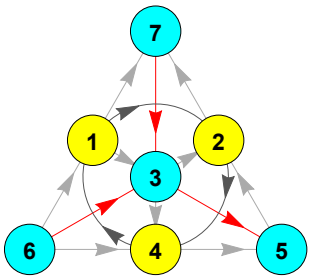
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_5	$-e_2$	$-e_3$	$-e_7$	e_6
e_2	$-e_4$	−1	$-e_6$	e_1	$-e_7$	e_3	e_5
e_3	$-e_5$	e_6	−1	e_7	e_1	$-e_2$	$-e_4$
e_4	e_2	$-e_1$	$-e_7$	−1	e_6	$-e_5$	e_3
e_5	e_3	e_7	$-e_1$	$-e_6$	−1	e_4	$-e_2$
e_6	e_7	$-e_3$	e_2	e_5	$-e_4$	−1	$-e_1$
e_7	$-e_6$	$-e_5$	e_4	$-e_3$	e_2	e_1	−1

split=1

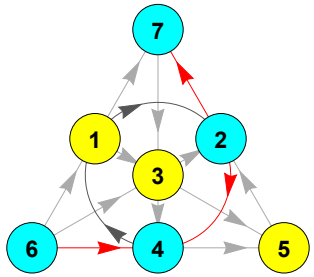
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	5	−2	−3	−7	6
2	−4	−1	−6	1	−7	3	5
3	−5	6	1	7	−1	2	4
4	2	−1	−7	−1	6	−5	3
5	3	7	1	−6	1	−4	2
6	7	−3	−2	5	4	1	1
7	−6	−5	−4	−3	−2	−1	1

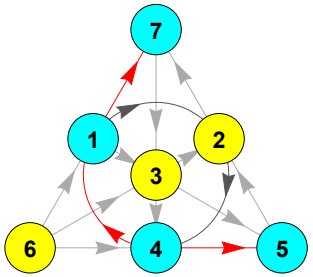
split=2

Fano plane



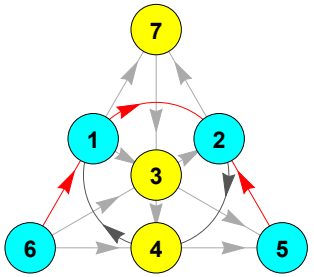
split=4

Fano plane



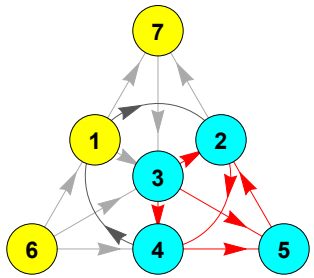
split=6

Fano plane



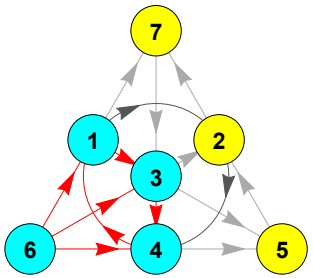
split=3

Fano plane



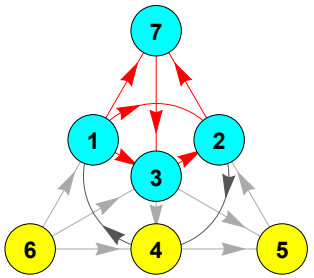
split=5

Fano plane



split=7

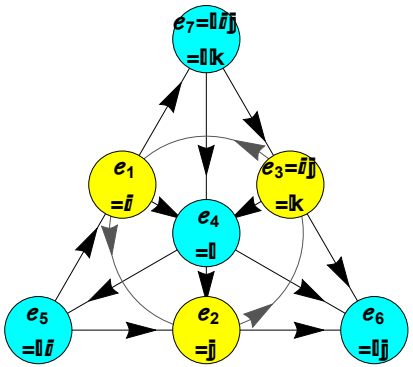
Fano plane



flip=True

{1, 2, 3}{1, 4, 6}{1, 7, 5}{2, 7, 4}{2, 6, 5}{3, 4, 5}{3, 6, 7}

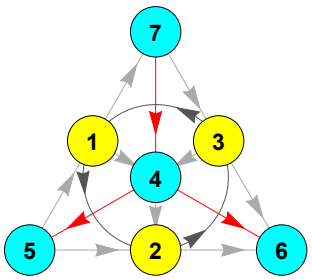
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	e_6	$-e_7$	$-e_4$	e_5
e_2	$-e_3$	−1	e_1	$-e_7$	$-e_6$	e_5	e_4
e_3	e_2	$-e_1$	−1	e_5	$-e_4$	e_7	$-e_6$
e_4	$-e_6$	e_7	$-e_5$	−1	e_3	e_1	$-e_2$
e_5	e_7	e_6	e_4	$-e_3$	−1	$-e_2$	$-e_1$
e_6	e_4	$-e_5$	$-e_7$	$-e_1$	e_2	−1	e_3
e_7	$-e_5$	$-e_4$	e_6	e_2	e_1	$-e_3$	−1

split=1

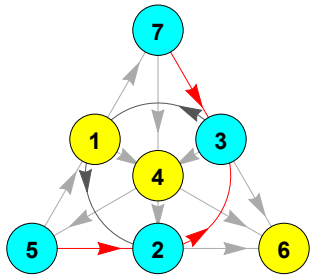
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	6	−7	−4	5
2	−3	−1	1	−7	−6	5	4
3	2	−1	−1	5	−4	7	−6
4	−6	7	−5	1	−3	−1	2
5	7	6	4	3	1	2	1
6	4	−5	−7	1	−2	1	−3
7	−5	−4	6	−2	−1	3	1

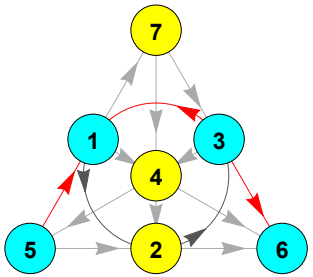
split=2

Fano plane



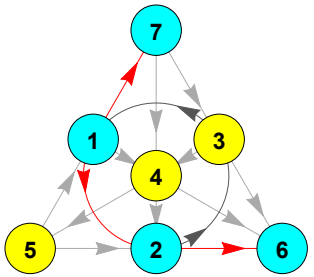
split=4

Fano plane



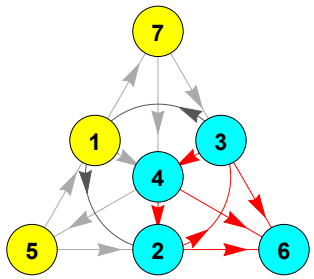
split=6

Fano plane



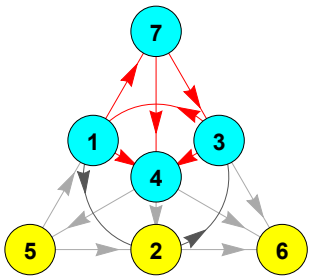
split=3

Fano plane



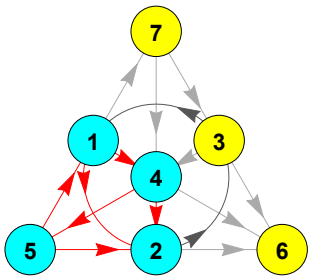
split=5

Fano plane



split=7

Fano plane

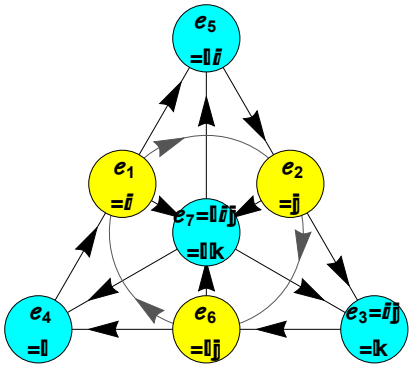


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
24	$\nu_{\mathrm{r}}{}^{0}_{\mathrm{wm}}{}_{\bar{R}}$		0apggsscc 001111100_2	Bn{ 0 0 1 0 1 0 0 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Rh 45

flip=False

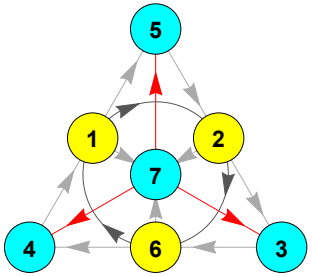
{1, 2, 6}{1, 7, 3}{1, 5, 4}{2, 3, 5}{2, 7, 4}{3, 6, 4}{5, 6, 7}

Fano plane



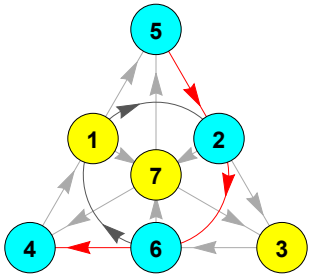
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_7$	$-e_5$	e_4	$-e_2$	e_3
e_2	$-e_6$	−1	e_5	$-e_7$	$-e_3$	e_1	e_4
e_3	e_7	$-e_5$	−1	$-e_6$	e_2	e_4	$-e_1$
e_4	e_5	e_7	e_6	−1	$-e_1$	$-e_3$	$-e_2$
e_5	$-e_4$	e_3	$-e_2$	e_1	−1	e_7	$-e_6$
e_6	e_2	$-e_1$	$-e_4$	e_3	$-e_7$	−1	e_5
e_7	$-e_3$	$-e_4$	e_1	e_2	e_6	$-e_5$	−1

split=1
Fano plane

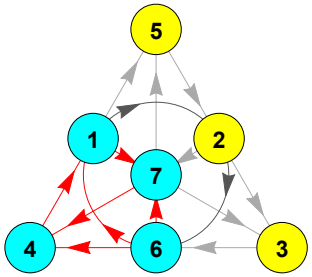


0↦1	1	2	3	4	5	6	7
1	−1	6	−7	−5	4	−2	3
2	−6	−1	5	−7	−3	1	4
3	7	−5	1	6	−2	4	1
4	5	7	−6	1	1	−3	2
5	−4	3	2	−1	1	7	6
6	2	−1	−4	3	−7	−1	5
7	−3	−4	−1	−2	−6	−5	1

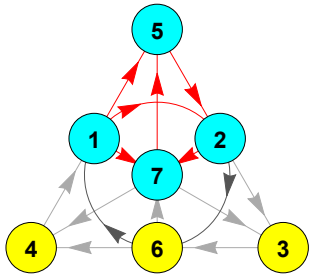
split=2
Fano plane



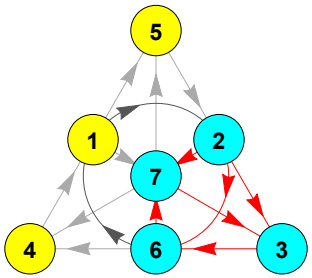
split=4
Fano plane



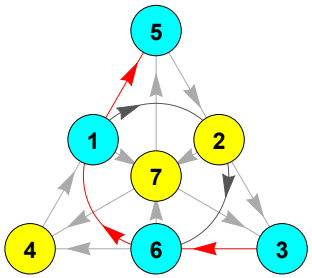
split=6
Fano plane



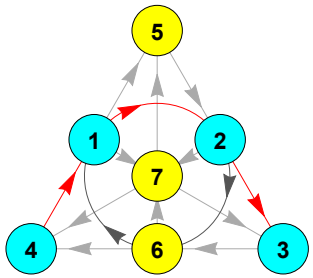
split=3
Fano plane



split=5
Fano plane



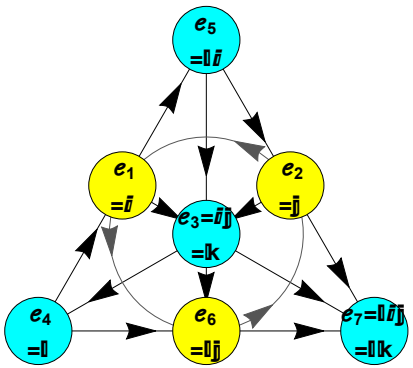
split=7
Fano plane



flip=True

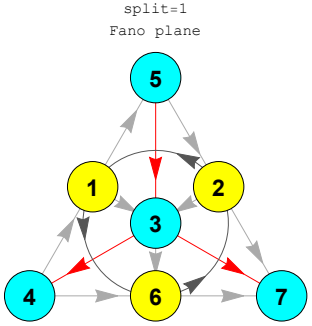
{1, 6, 2}{1, 3, 7}{1, 5, 4}{2, 3, 4}{2, 7, 5}{3, 6, 5}{4, 6, 7}

Fano plane



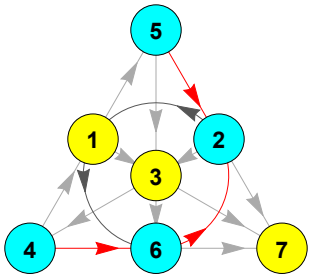
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	e_7	$-e_5$	e_4	e_2	$-e_3$
e_2	e_6	−1	e_4	$-e_3$	$-e_7$	$-e_1$	e_5
e_3	$-e_7$	$-e_4$	−1	e_2	$-e_6$	e_5	e_1
e_4	e_5	e_3	$-e_2$	−1	$-e_1$	e_7	$-e_6$
e_5	$-e_4$	e_7	e_6	e_1	−1	$-e_3$	$-e_2$
e_6	$-e_2$	e_1	$-e_5$	$-e_7$	e_3	−1	e_4
e_7	e_3	$-e_5$	$-e_1$	e_6	e_2	$-e_4$	−1

split=1
Fano plane

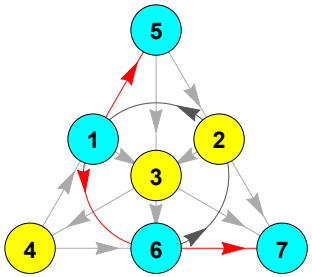


0↦1	1	2	3	4	5	6	7
1	−1	−6	7	−5	4	2	−3
2	6	−1	4	−3	−7	−1	5
3	−7	−4	1	−2	6	5	−1
4	5	3	2	1	1	7	6
5	−4	7	−6	−1	1	−3	2
6	−2	1	−5	−7	3	−1	4
7	3	−5	1	−6	−2	−4	1

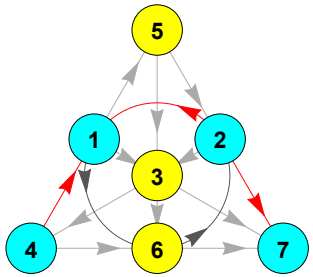
split=2
Fano plane



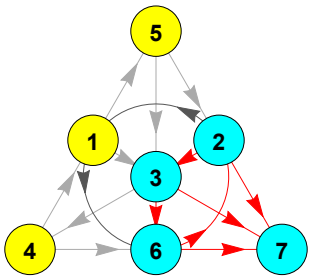
split=4
Fano plane



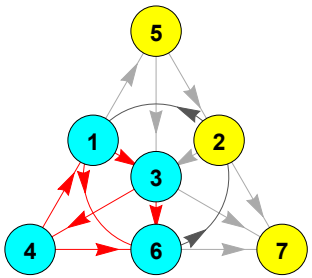
split=6
Fano plane



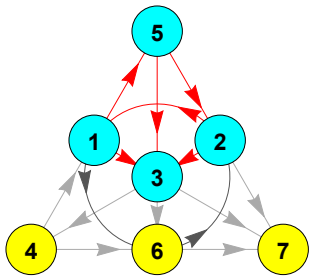
split=3
Fano plane

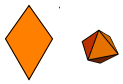


split=5
Fano plane



split=7
Fano plane

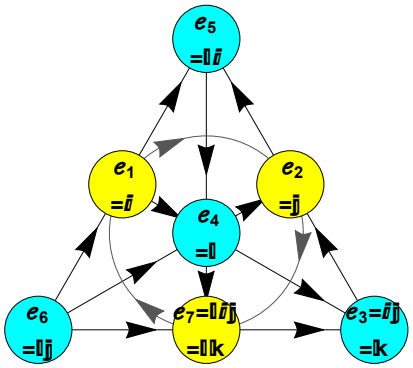


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
25	$\overline{b}_{\overline{t}}^{\overline{o_m}}{}^{\mapsto 1/3}$		0apggsscc 010111001_2	Bn{ 0 0 1 0 0 1 0 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Y 39

flip=False

{1, 2, 7}{1, 4, 3}{1, 5, 6}{2, 5, 3}{2, 6, 4}{3, 6, 7}{4, 7, 5}

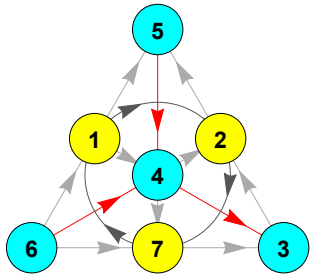
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_4$	e_3	e_6	$-e_5$	$-e_2$
e_2	$-e_7$	−1	$-e_5$	$-e_6$	e_3	e_4	e_1
e_3	e_4	e_5	−1	$-e_1$	$-e_2$	e_7	$-e_6$
e_4	$-e_3$	e_6	e_1	−1	$-e_7$	$-e_2$	e_5
e_5	$-e_6$	$-e_3$	e_2	e_7	−1	e_1	$-e_4$
e_6	e_5	$-e_4$	$-e_7$	e_2	$-e_1$	−1	e_3
e_7	e_2	$-e_1$	e_6	$-e_5$	e_4	$-e_3$	−1

split=1

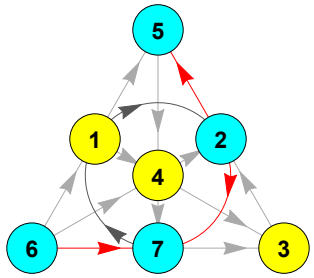
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−4	3	6	−5	−2
2	−7	−1	−5	−6	3	4	1
3	4	5	1	1	2	−7	−6
4	−3	6	−1	1	7	2	5
5	−6	−3	−2	−7	1	−1	−4
6	5	−4	7	−2	1	1	3
7	2	−1	6	−5	4	−3	−1

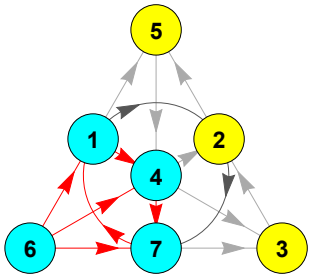
split=2

Fano plane



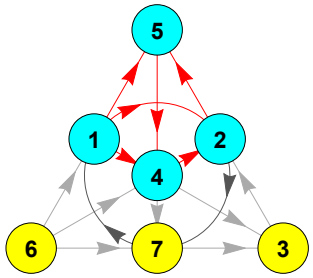
split=4

Fano plane



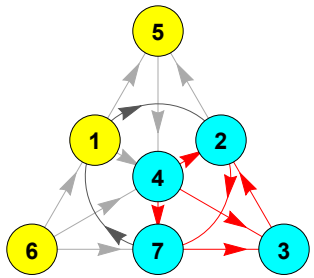
split=6

Fano plane



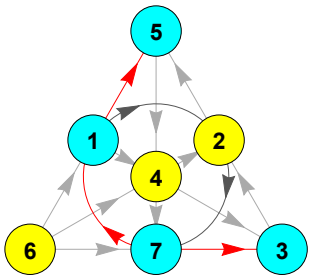
split=3

Fano plane



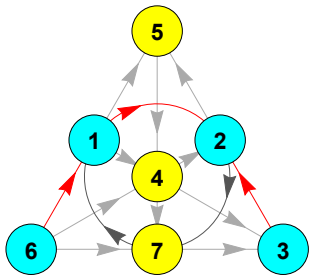
split=5

Fano plane



split=7

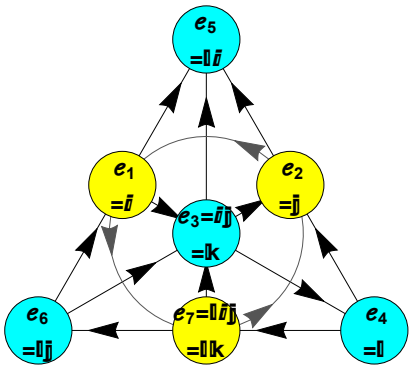
Fano plane



flip=True

{1, 7, 2}{1, 3, 4}{1, 5, 6}{2, 6, 3}{2, 5, 4}{3, 5, 7}{4, 7, 6}

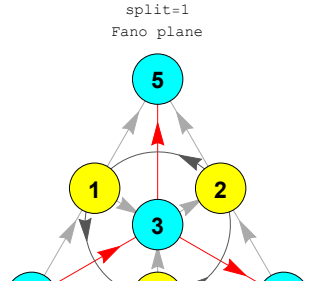
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_4	$-e_3$	e_6	$-e_5$	e_2
e_2	e_7	−1	$-e_6$	$-e_5$	e_4	e_3	$-e_1$
e_3	$-e_4$	e_6	−1	e_1	e_7	$-e_2$	$-e_5$
e_4	e_3	e_5	$-e_1$	−1	$-e_2$	$-e_7$	e_6
e_5	$-e_6$	$-e_4$	$-e_7$	e_2	−1	e_1	e_3
e_6	e_5	$-e_3$	e_2	e_7	$-e_1$	−1	$-e_4$
e_7	$-e_2$	e_1	e_5	$-e_6$	$-e_3$	e_4	−1

split=1

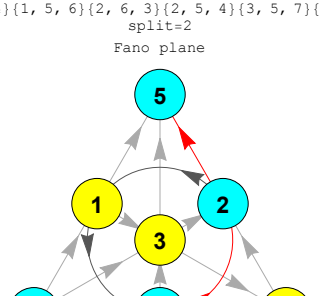
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	4	−3	6	−5	2
2	7	−1	−6	−5	4	3	−1
3	−4	6	1	−1	−7	2	−5
4	3	5	1	1	2	7	6
5	−6	−4	7	−2	1	−1	3
6	5	−3	−2	−7	1	1	−4
7	−2	1	5	−6	−3	4	−1

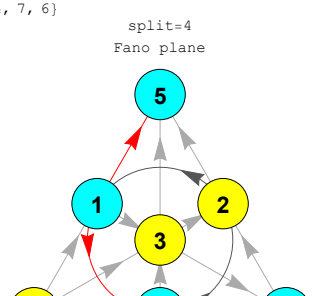
split=2

Fano plane



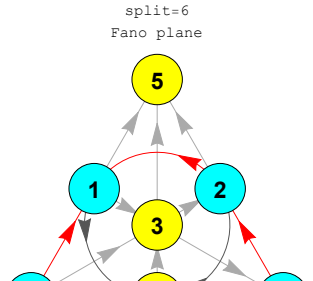
split=4

Fano plane



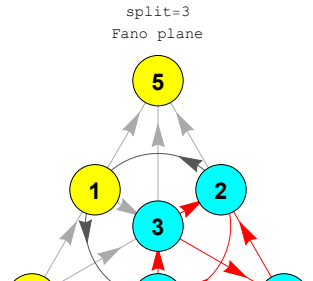
split=6

Fano plane



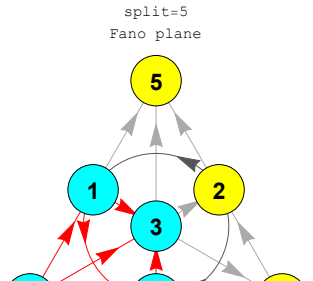
split=3

Fano plane



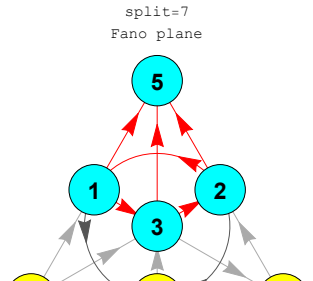
split=5

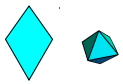
Fano plane



split=7

Fano plane

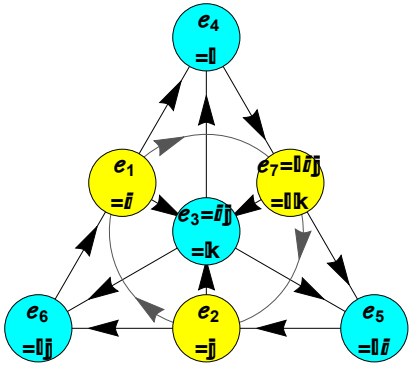


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
26	$\overline{\underset{cm}{b}}^{\frac{1}{L}\mapsto 1/3}$		0apggsscc 010111010_2	Bn{ E8{	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	As 33

flip=False

{1, 7, 2}{1, 3, 5}{1, 4, 6}{2, 3, 4}{2, 6, 5}{3, 6, 7}{4, 7, 5}

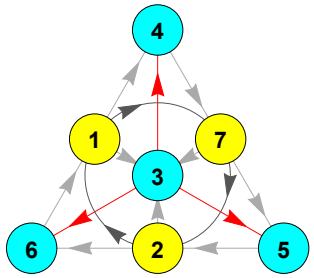
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_5	e_6	$-e_3$	$-e_4$	e_2
e_2	e_7	−1	e_4	$-e_3$	$-e_6$	e_5	$-e_1$
e_3	$-e_5$	$-e_4$	−1	e_2	e_1	e_7	$-e_6$
e_4	$-e_6$	e_3	$-e_2$	−1	$-e_7$	e_1	e_5
e_5	e_3	e_6	$-e_1$	e_7	−1	$-e_2$	$-e_4$
e_6	e_4	$-e_5$	$-e_7$	$-e_1$	e_2	−1	e_3
e_7	$-e_2$	e_1	e_6	$-e_5$	e_4	$-e_3$	−1

split=1

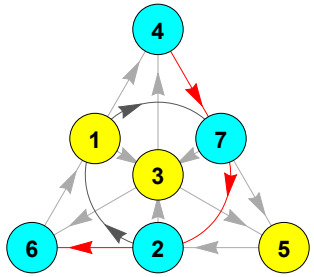
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	5	6	−3	−4	2
2	7	−1	4	−3	−6	5	−1
3	−5	−4	1	−2	−1	−7	−6
4	−6	3	2	1	7	−1	5
5	3	6	1	−7	1	2	−4
6	4	−5	7	1	−2	1	3
7	−2	1	6	−5	4	−3	−1

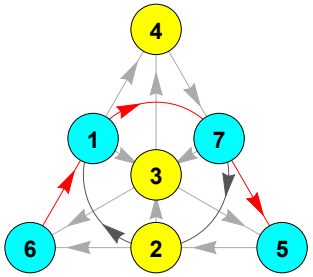
split=2

Fano plane



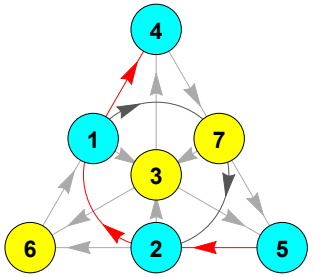
split=4

Fano plane



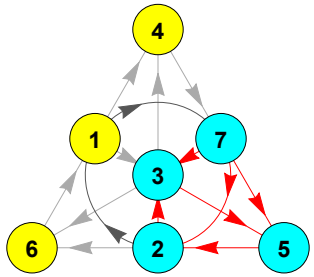
split=6

Fano plane



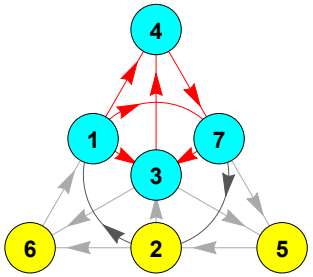
split=3

Fano plane



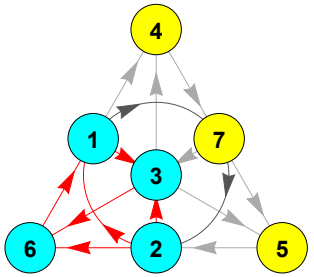
split=5

Fano plane



split=7

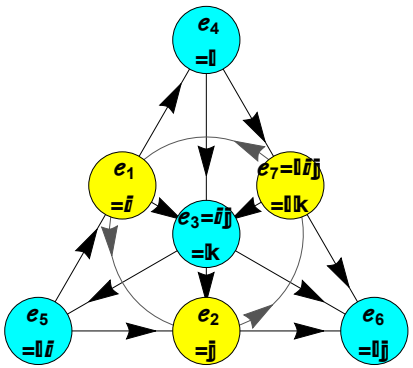
Fano plane



flip=True

{1, 2, 7}{1, 3, 6}{1, 4, 5}{2, 4, 3}{2, 6, 5}{3, 5, 7}{4, 7, 6}

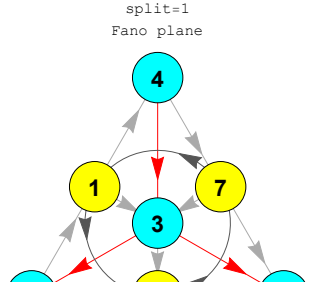
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_6	e_5	$-e_4$	$-e_3$	$-e_2$
e_2	$-e_7$	−1	$-e_4$	e_3	$-e_6$	e_5	e_1
e_3	$-e_6$	e_4	−1	$-e_2$	e_7	e_1	$-e_5$
e_4	$-e_5$	$-e_3$	e_2	−1	e_1	$-e_7$	e_6
e_5	e_4	e_6	$-e_7$	$-e_1$	−1	$-e_2$	e_3
e_6	e_3	$-e_5$	$-e_1$	e_7	e_2	−1	$-e_4$
e_7	e_2	$-e_1$	e_5	$-e_6$	$-e_3$	e_4	−1

split=1

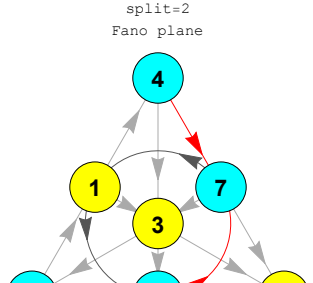
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	6	5	−4	−3	−2
2	−7	−1	−4	3	−6	5	1
3	−6	4	1	2	−7	−1	−5
4	−5	−3	−2	1	−1	7	6
5	4	6	7	1	1	2	3
6	3	−5	1	−7	−2	1	−4
7	2	−1	5	−6	−3	4	−1

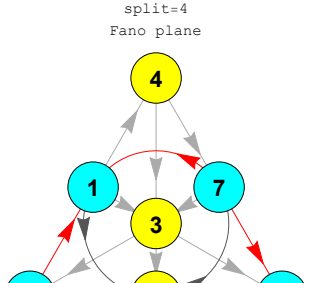
split=2

Fano plane



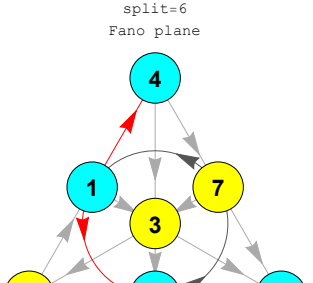
split=4

Fano plane



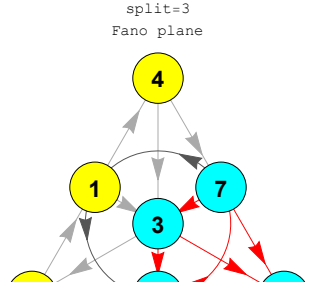
split=6

Fano plane



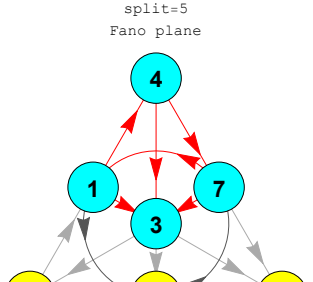
split=3

Fano plane



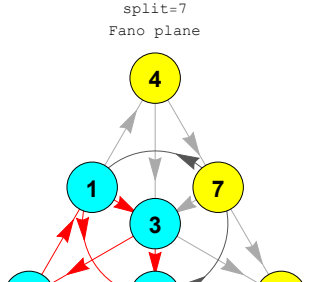
split=5

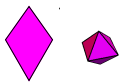
Fano plane



split=7

Fano plane

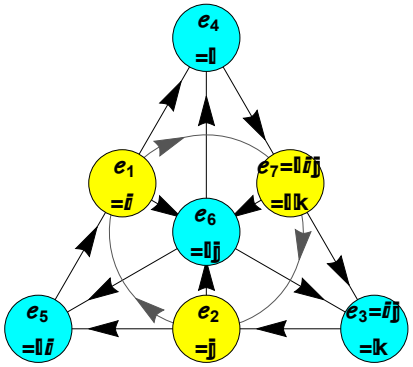


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
27	$\overline{\underset{m}{b}}^{1/3}_{t}$		0apggsscc 010111011_2	Bn{ 0 0 1 0 0 0 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\overline{No}}$ 102

flip=False

{1, 7, 2}{1, 6, 3}{1, 4, 5}{2, 5, 3}{2, 6, 4}{3, 4, 7}{5, 7, 6}

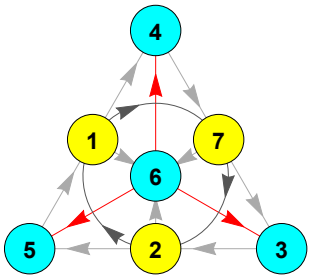
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	$-e_6$	e_5	$-e_4$	e_3	e_2
e_2	e_2	$-e_7$	−1	$-e_5$	e_6	e_3	e_4	$-e_1$
e_3	e_3	e_6	e_5	−1	e_7	$-e_2$	$-e_1$	$-e_4$
e_4	e_4	$-e_5$	e_6	$-e_7$	−1	e_1	$-e_2$	e_3
e_5	e_5	e_4	$-e_3$	e_2	$-e_1$	−1	$-e_7$	e_6
e_6	e_6	$-e_3$	$-e_4$	e_1	e_2	e_7	−1	$-e_5$
e_7	e_7	$-e_2$	e_1	e_4	$-e_3$	$-e_6$	e_5	−1

split=1

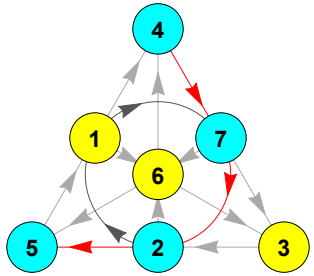
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−6	5	−4	3	2
2	7	−1	−5	−6	3	4	−1
3	6	5	1	−7	2	1	−4
4	−5	6	7	1	−1	2	3
5	4	−3	−2	1	1	7	6
6	−3	−4	−1	−2	−7	1	−5
7	−2	1	4	−3	−6	5	−1

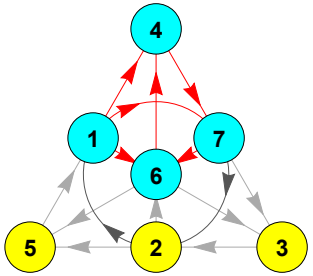
split=2

Fano plane



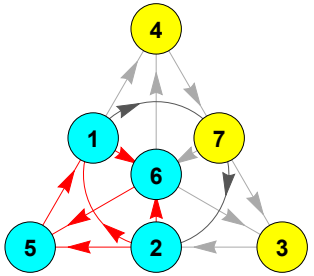
split=4

Fano plane



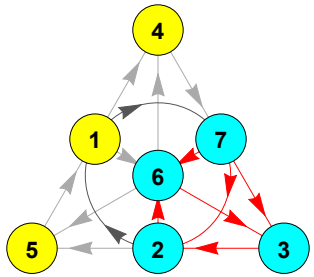
split=6

Fano plane



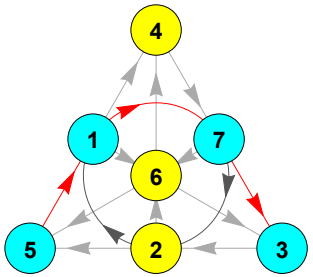
split=3

Fano plane



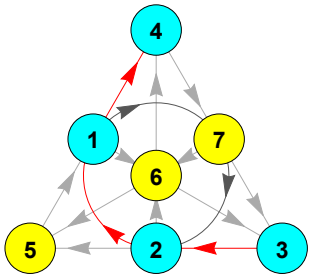
split=5

Fano plane



split=7

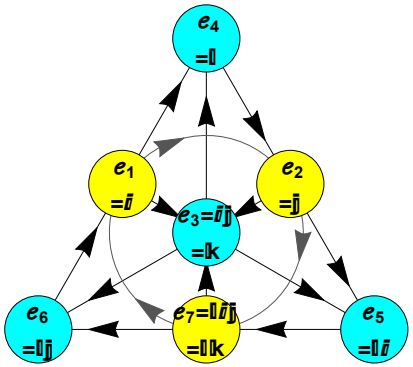
Fano plane



flip=True

{1, 2, 7}{1, 3, 5}{1, 4, 6}{2, 3, 6}{2, 5, 4}{3, 4, 7}{5, 7, 6}

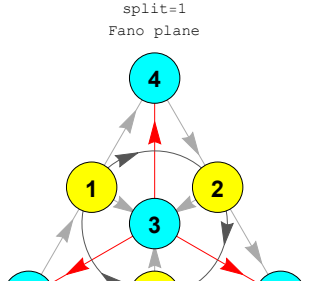
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	e_5	e_6	$-e_3$	$-e_4$	$-e_2$
e_2	e_2	$-e_7$	−1	e_6	$-e_5$	e_4	$-e_3$	e_1
e_3	e_3	$-e_5$	$-e_6$	−1	e_7	e_1	e_2	$-e_4$
e_4	e_4	$-e_6$	e_5	$-e_7$	−1	$-e_2$	e_1	e_3
e_5	e_5	e_3	$-e_4$	$-e_1$	e_2	−1	$-e_7$	e_6
e_6	e_6	e_4	e_3	$-e_2$	$-e_1$	e_7	−1	$-e_5$
e_7	e_7	e_2	$-e_1$	e_4	$-e_3$	$-e_6$	e_5	−1

split=1

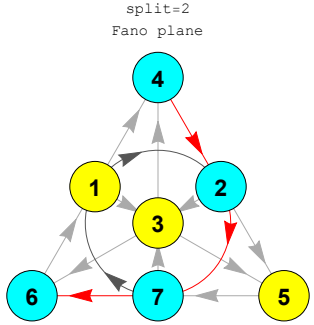
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	5	6	−3	−4	−2
2	−7	−1	6	−5	4	−3	1
3	−5	−6	1	−7	−1	−2	−4
4	−6	5	7	1	2	−1	3
5	3	−4	1	−2	1	7	6
6	4	3	2	1	−7	1	−5
7	2	−1	4	−3	−6	5	−1

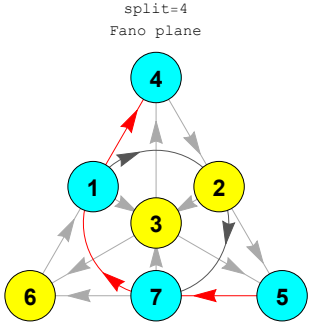
split=2

Fano plane



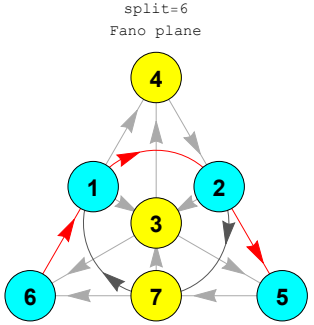
split=4

Fano plane



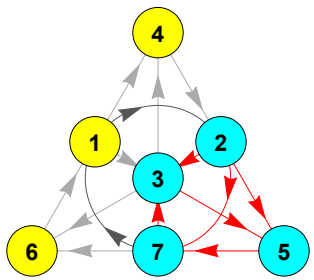
split=6

Fano plane



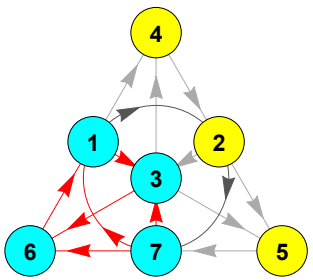
split=3

Fano plane



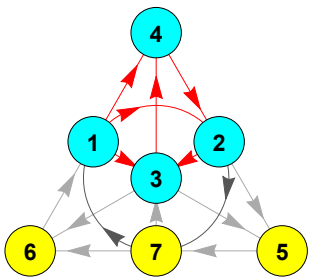
split=5

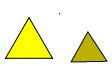
Fano plane



split=7

Fano plane

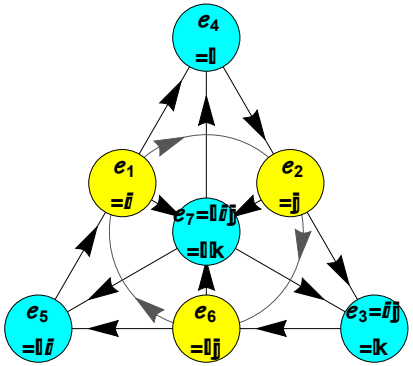


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates	Ele #
28	$\begin{smallmatrix}\Gamma & - \\ ym & R\end{smallmatrix}$		0apggsscc	000111100_2	Bn{ 0 0 0 1 1 0 0 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Rb 37

flip=False

{1, 2, 6}{1, 7, 3}{1, 4, 5}{2, 3, 4}{2, 7, 5}{3, 6, 5}{4, 6, 7}

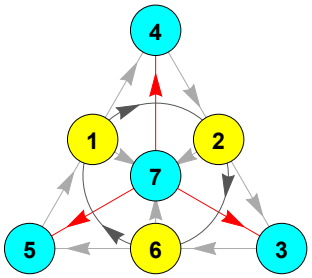
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_7$	e_5	$-e_4$	$-e_2$	e_3
e_2	$-e_6$	−1	e_4	$-e_3$	$-e_7$	e_1	e_5
e_3	e_7	$-e_4$	−1	e_2	$-e_6$	e_5	$-e_1$
e_4	$-e_5$	e_3	$-e_2$	−1	e_1	e_7	$-e_6$
e_5	e_4	e_7	e_6	$-e_1$	−1	$-e_3$	$-e_2$
e_6	e_2	$-e_1$	$-e_5$	$-e_7$	e_3	−1	e_4
e_7	$-e_3$	$-e_5$	e_1	e_6	e_2	$-e_4$	−1

split=1

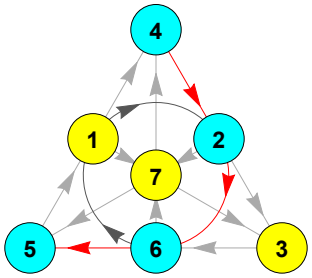
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−7	5	−4	−2	3
2	−6	−1	4	−3	−7	1	5
3	7	−4	1	−2	6	5	1
4	−5	3	2	1	−1	7	6
5	4	7	−6	1	1	−3	2
6	2	−1	−5	−7	3	−1	4
7	−3	−5	−1	−6	−2	−4	1

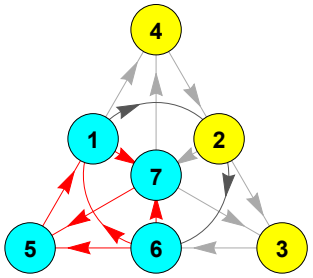
split=2

Fano plane



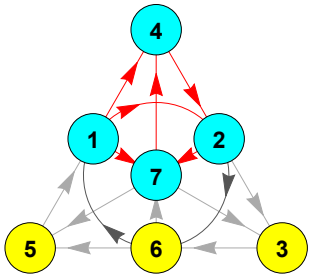
split=4

Fano plane



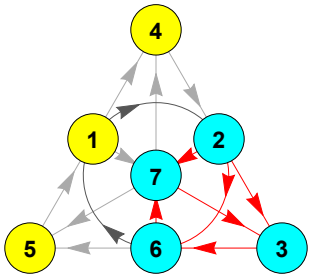
split=6

Fano plane



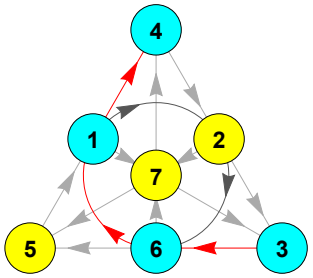
split=3

Fano plane



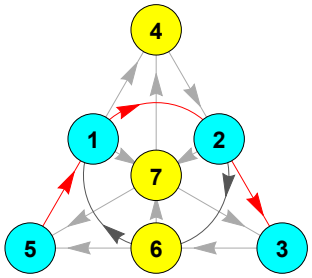
split=5

Fano plane



split=7

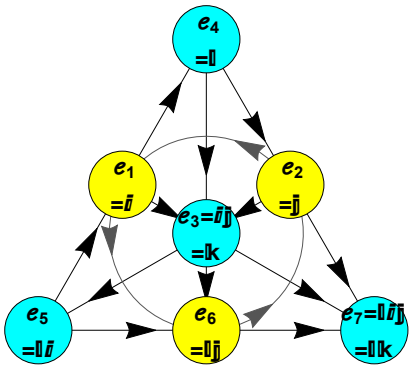
Fano plane



flip=True

{1, 6, 2}{1, 3, 7}{1, 4, 5}{2, 3, 5}{2, 7, 4}{3, 6, 4}{5, 6, 7}

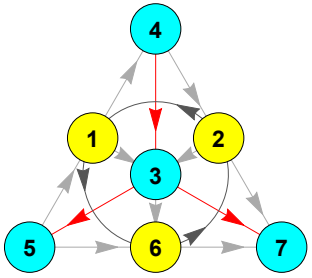
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	e_7	e_5	$-e_4$	e_2	$-e_3$
e_2	e_6	−1	e_5	$-e_7$	$-e_3$	$-e_1$	e_4
e_3	$-e_7$	$-e_5$	−1	$-e_6$	e_2	e_4	e_1
e_4	$-e_5$	e_7	e_6	−1	e_1	$-e_3$	$-e_2$
e_5	e_4	e_3	$-e_2$	$-e_1$	−1	e_7	$-e_6$
e_6	$-e_2$	e_1	$-e_4$	e_3	$-e_7$	−1	e_5
e_7	e_3	$-e_4$	$-e_1$	e_2	e_6	$-e_5$	−1

split=1

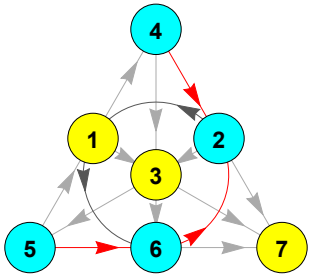
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	7	5	−4	2	−3
2	6	−1	5	−7	−3	−1	4
3	−7	−5	1	6	−2	4	−1
4	−5	7	−6	1	−1	−3	2
5	4	3	2	1	1	7	6
6	−2	1	−4	3	−7	−1	5
7	3	−4	1	−2	−6	−5	1

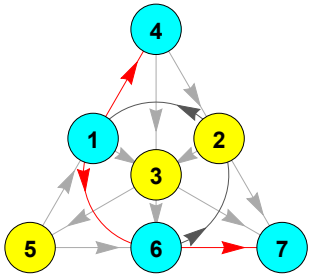
split=2

Fano plane



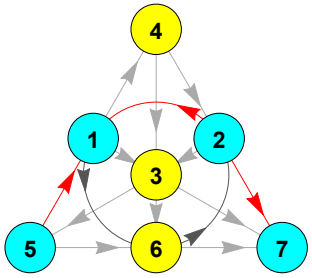
split=4

Fano plane



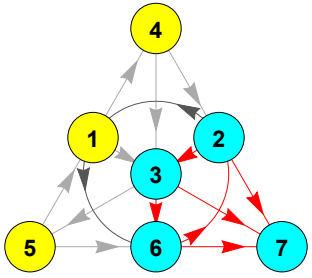
split=6

Fano plane



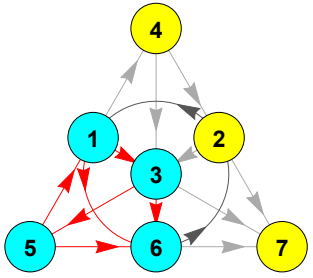
split=3

Fano plane



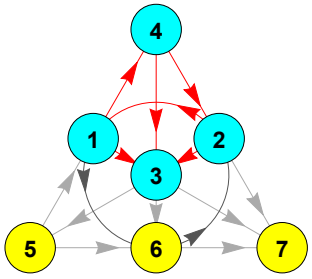
split=5

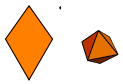
Fano plane



split=7

Fano plane

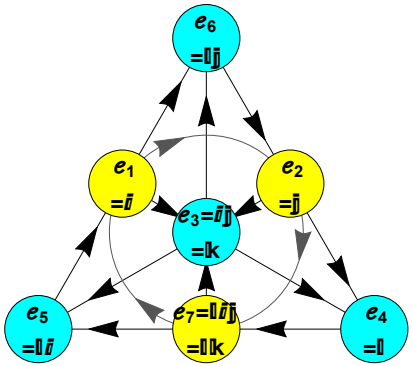


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
29	$\overline{\underset{\circ_m}{b}}^{\,+\to-2/3}_{\vec{R}}$		0apggsscc 0101111101_2	Bn{ 0 0 0 1 0 1 0 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Ga 31

flip=False

{1, 2, 7}{1, 3, 4}{1, 6, 5}{2, 3, 5}{2, 4, 6}{3, 6, 7}{4, 7, 5}

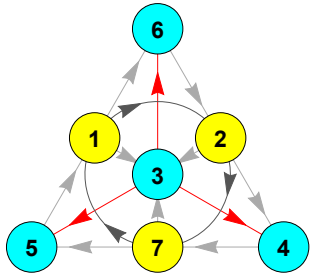
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	e_4	$-e_3$	$-e_6$	e_5	$-e_2$
e_2	e_2	$-e_7$	−1	e_5	e_6	$-e_3$	$-e_4$	e_1
e_3	e_3	$-e_4$	$-e_5$	−1	e_1	e_2	e_7	$-e_6$
e_4	e_4	e_3	$-e_6$	$-e_1$	−1	$-e_7$	e_2	e_5
e_5	e_5	e_6	e_3	$-e_2$	e_7	−1	$-e_1$	$-e_4$
e_6	e_6	$-e_5$	e_4	$-e_7$	$-e_2$	e_1	−1	e_3
e_7	e_7	e_2	$-e_1$	e_6	$-e_5$	e_4	$-e_3$	−1

split=1

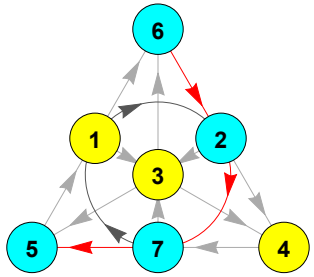
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	4	−3	−6	5	−2
2	−7	−1	5	6	−3	−4	1
3	−4	−5	1	−1	−2	−7	−6
4	3	−6	1	1	7	−2	5
5	6	3	2	−7	1	1	−4
6	−5	4	7	2	−1	1	3
7	2	−1	6	−5	4	−3	−1

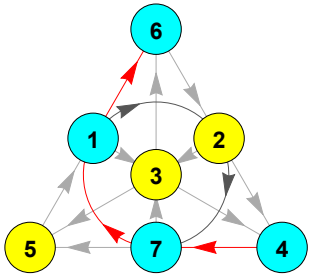
split=2

Fano plane



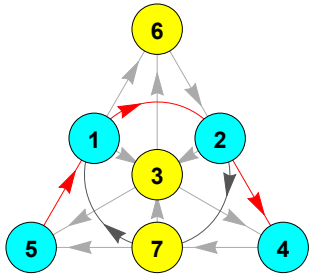
split=4

Fano plane



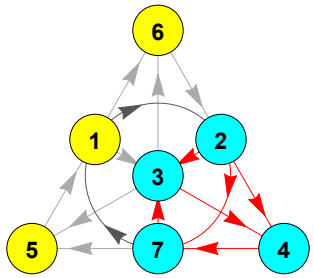
split=6

Fano plane



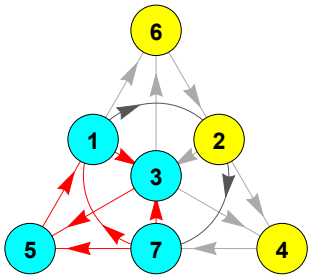
split=3

Fano plane



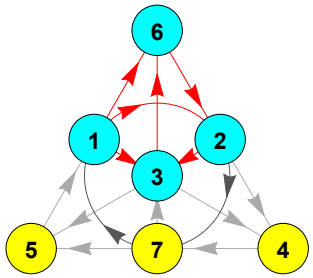
split=5

Fano plane



split=7

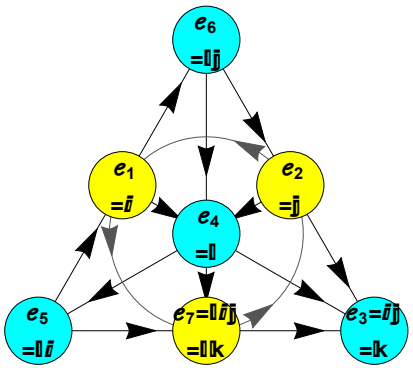
Fano plane



flip=True

{1, 7, 2}{1, 4, 3}{1, 6, 5}{2, 3, 6}{2, 4, 5}{3, 5, 7}{4, 7, 6}

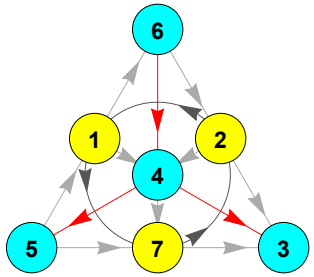
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	$-e_4$	e_3	$-e_6$	e_5	e_2
e_2	e_2	e_7	−1	e_6	e_5	$-e_4$	$-e_3$	$-e_1$
e_3	e_3	e_4	$-e_6$	−1	$-e_1$	e_7	e_2	$-e_5$
e_4	e_4	$-e_3$	$-e_5$	e_1	−1	e_2	$-e_7$	e_6
e_5	e_5	e_6	e_4	$-e_7$	$-e_2$	−1	$-e_1$	e_3
e_6	e_6	$-e_5$	e_3	$-e_2$	e_7	e_1	−1	$-e_4$
e_7	e_7	$-e_2$	e_1	e_5	$-e_6$	$-e_3$	e_4	−1

split=1

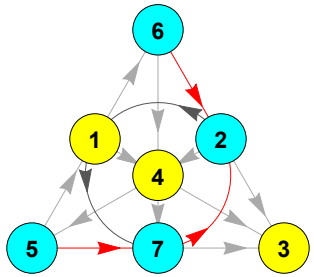
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−4	3	−6	5	2
2	7	−1	6	5	−4	−3	−1
3	4	−6	1	1	−7	−2	−5
4	−3	−5	−1	1	−2	7	6
5	6	4	7	2	1	1	3
6	−5	3	2	−7	−1	1	−4
7	−2	1	5	−6	−3	4	−1

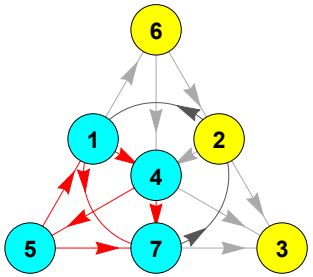
split=2

Fano plane



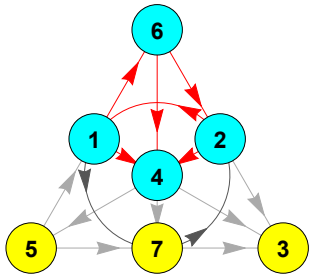
split=4

Fano plane



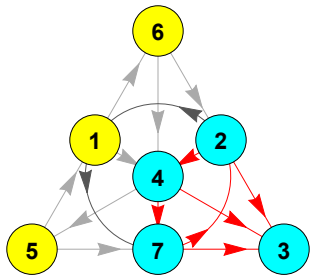
split=6

Fano plane



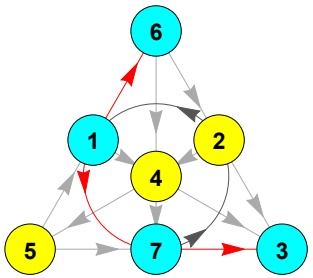
split=3

Fano plane



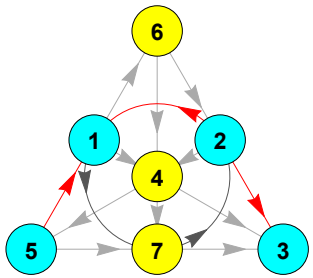
split=5

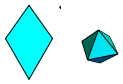
Fano plane



split=7

Fano plane

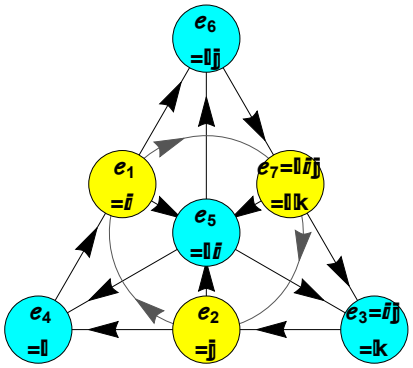


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
30	$\overline{\underset{\mathbb{C}m}{b}}^{\,t\mapsto -2/3}_{\mathbb{R}}$		0apggsscc 0101111110_2	Bn{ 0 0 0 1 0 0 1 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Mn 25

flip=False

{1, 7, 2}{1, 5, 3}{1, 6, 4}{2, 4, 3}{2, 5, 6}{3, 6, 7}{4, 7, 5}

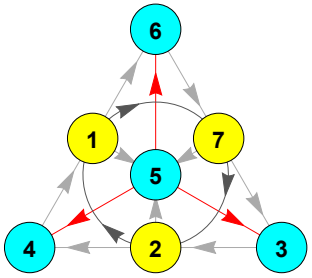
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_5$	$-e_6$	e_3	e_4	e_2
e_2	e_7	−1	$-e_4$	e_3	e_6	$-e_5$	$-e_1$
e_3	e_5	e_4	−1	$-e_2$	$-e_1$	e_7	$-e_6$
e_4	e_6	$-e_3$	e_2	−1	$-e_7$	$-e_1$	e_5
e_5	$-e_3$	$-e_6$	e_1	e_7	−1	e_2	$-e_4$
e_6	$-e_4$	e_5	$-e_7$	e_1	$-e_2$	−1	e_3
e_7	$-e_2$	e_1	e_6	$-e_5$	e_4	$-e_3$	−1

split=1

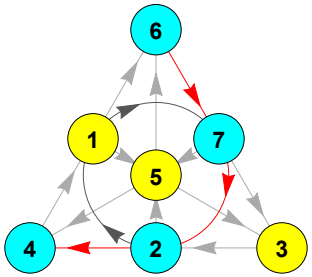
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−5	−6	3	4	2
2	7	−1	−4	3	6	−5	−1
3	5	4	1	2	1	−7	−6
4	6	−3	−2	1	7	1	5
5	−3	−6	−1	−7	1	−2	−4
6	−4	5	7	−1	2	1	3
7	−2	1	6	−5	4	−3	−1

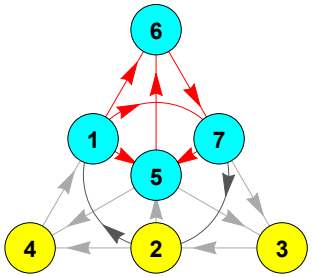
split=2

Fano plane



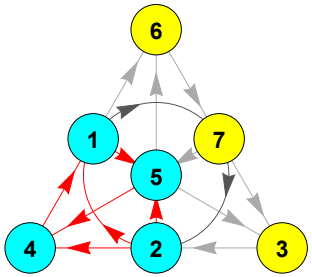
split=4

Fano plane



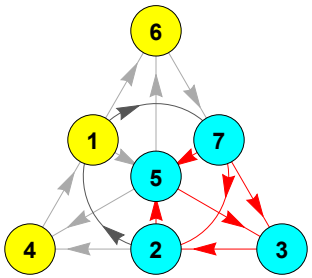
split=6

Fano plane



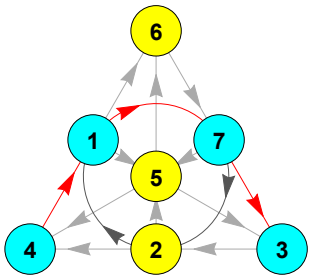
split=3

Fano plane



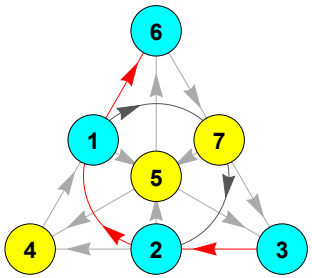
split=5

Fano plane



split=7

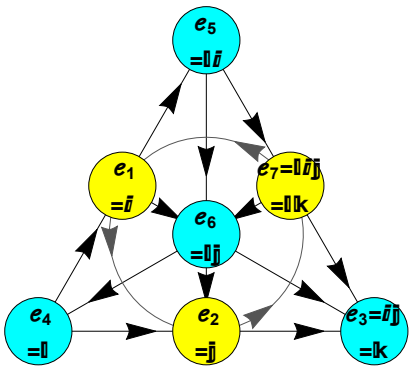
Fano plane



flip=True

{1, 2, 7}{1, 6, 3}{1, 5, 4}{2, 3, 4}{2, 5, 6}{3, 5, 7}{4, 7, 6}

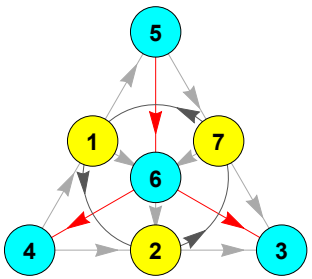
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_6$	$-e_5$	e_4	e_3	$-e_2$
e_2	$-e_7$	−1	e_4	$-e_3$	e_6	$-e_5$	e_1
e_3	e_6	$-e_4$	−1	e_2	e_7	$-e_1$	$-e_5$
e_4	e_5	e_3	$-e_2$	−1	$-e_1$	$-e_7$	e_6
e_5	$-e_4$	$-e_6$	$-e_7$	e_1	−1	e_2	e_3
e_6	$-e_3$	e_5	e_1	e_7	$-e_2$	−1	$-e_4$
e_7	e_2	$-e_1$	e_5	$-e_6$	$-e_3$	e_4	−1

split=1

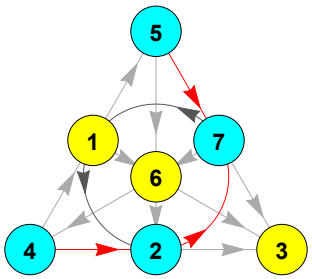
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−6	−5	4	3	−2
2	−7	−1	4	−3	6	−5	1
3	6	−4	1	−2	−7	1	−5
4	5	3	2	1	1	7	6
5	−4	−6	7	−1	1	−2	3
6	−3	5	−1	−7	2	1	−4
7	2	−1	5	−6	−3	4	−1

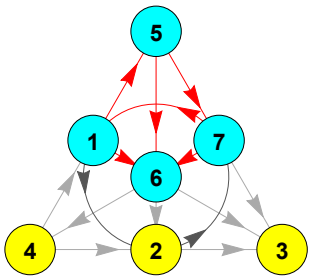
split=2

Fano plane



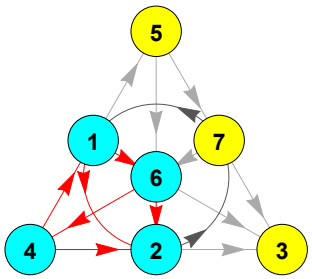
split=4

Fano plane



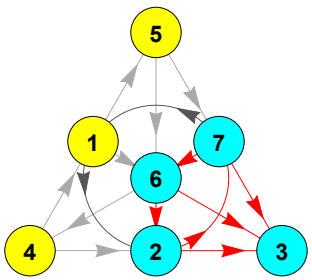
split=6

Fano plane



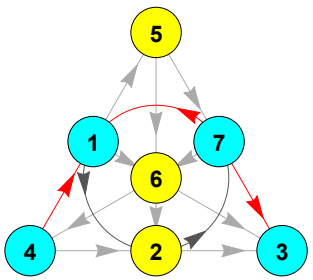
split=3

Fano plane



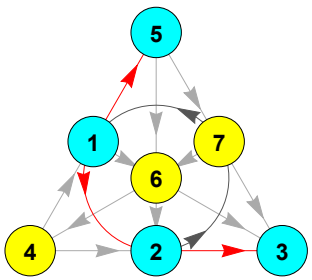
split=5

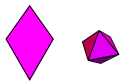
Fano plane



split=7

Fano plane

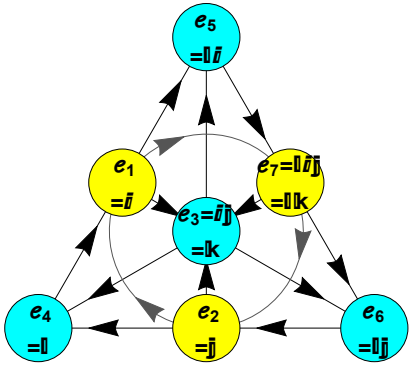


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
31	$\overline{\underset{m_m}{b}}^{1/3\to-2/3}$		0apggsscc 0101111111_2	Bn{ 0 0 0 1 0 0 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Db}$ 105

flip=False

{1, 7, 2}{1, 3, 6}{1, 5, 4}{2, 3, 5}{2, 4, 6}{3, 4, 7}{5, 7, 6}

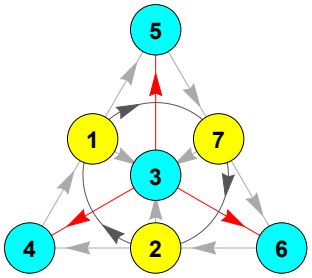
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_6	$-e_5$	e_4	$-e_3$	e_2
e_2	e_7	−1	e_5	e_6	$-e_3$	$-e_4$	$-e_1$
e_3	$-e_6$	$-e_5$	−1	e_7	e_2	e_1	$-e_4$
e_4	e_5	$-e_6$	$-e_7$	−1	$-e_1$	e_2	e_3
e_5	$-e_4$	e_3	$-e_2$	e_1	−1	$-e_7$	e_6
e_6	e_3	e_4	$-e_1$	$-e_2$	e_7	−1	$-e_5$
e_7	$-e_2$	e_1	e_4	$-e_3$	$-e_6$	e_5	−1

split=1

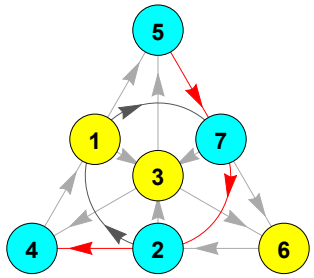
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	6	−5	4	−3	2
2	7	−1	5	6	−3	−4	−1
3	−6	−5	1	−7	−2	−1	−4
4	5	−6	7	1	1	−2	3
5	−4	3	2	−1	1	7	6
6	3	4	1	2	−7	1	−5
7	−2	1	4	−3	−6	5	−1

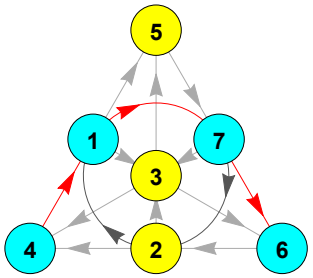
split=2

Fano plane



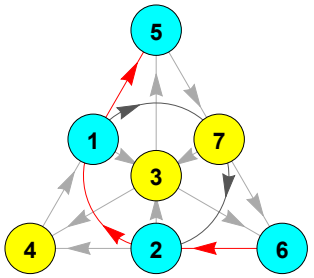
split=4

Fano plane



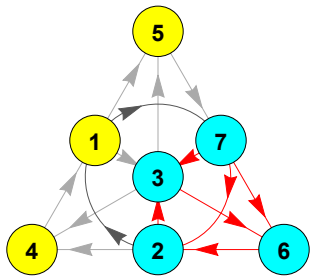
split=6

Fano plane



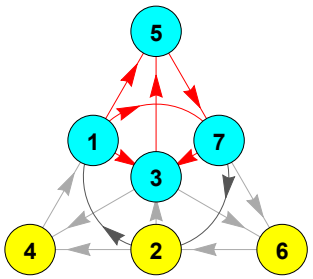
split=3

Fano plane



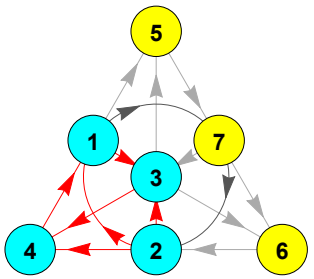
split=5

Fano plane



split=7

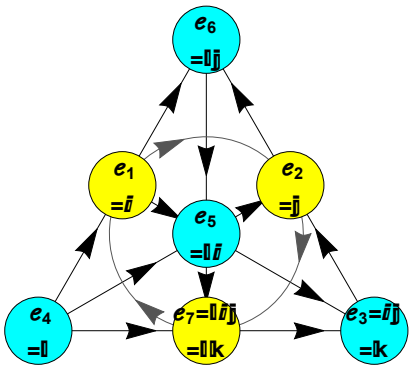
Fano plane



flip=True

{1, 2, 7}{1, 5, 3}{1, 6, 4}{2, 6, 3}{2, 4, 5}{3, 4, 7}{5, 7, 6}

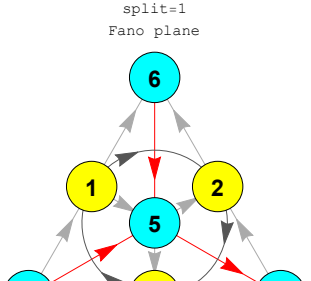
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_5$	$-e_6$	e_3	e_4	$-e_2$
e_2	$-e_7$	−1	$-e_6$	e_5	$-e_4$	e_3	e_1
e_3	e_5	e_6	−1	e_7	$-e_1$	$-e_2$	$-e_4$
e_4	e_6	$-e_5$	$-e_7$	−1	e_2	$-e_1$	e_3
e_5	$-e_3$	e_4	e_1	$-e_2$	−1	$-e_7$	e_6
e_6	$-e_4$	$-e_3$	e_2	e_1	e_7	−1	$-e_5$
e_7	e_2	$-e_1$	e_4	$-e_3$	$-e_6$	e_5	−1

split=1

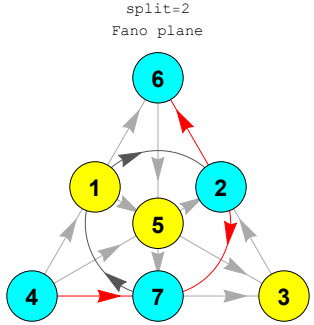
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−5	−6	3	4	−2
2	−7	−1	−6	5	−4	3	1
3	5	6	1	−7	1	2	−4
4	6	−5	7	1	−2	1	3
5	−3	4	−1	2	1	7	6
6	−4	−3	−2	−1	−7	1	−5
7	2	−1	4	−3	−6	5	−1

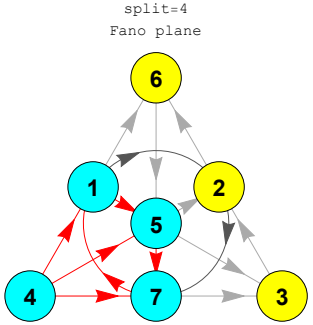
split=2

Fano plane



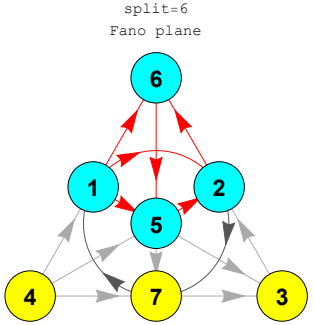
split=4

Fano plane



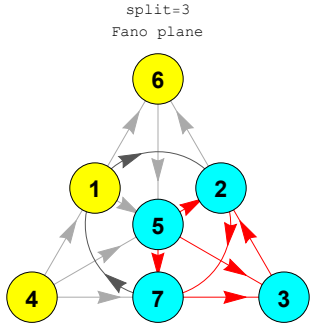
split=6

Fano plane



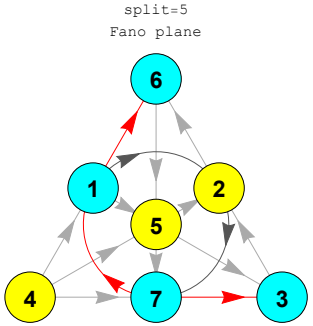
split=3

Fano plane



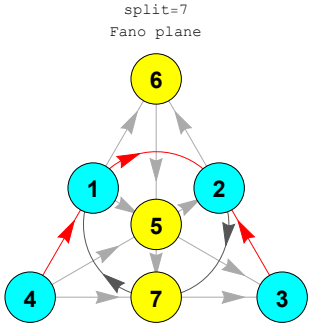
split=5

Fano plane



split=7

Fano plane

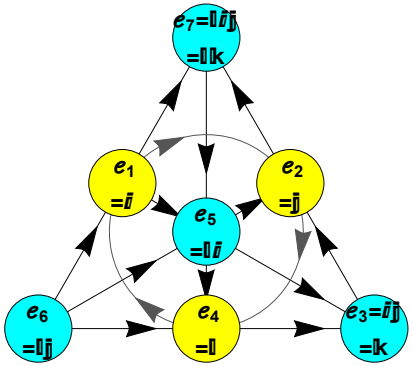


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates	Ele #
32	$\overline{\underset{\circ_d}{d}}^{\,+\mapsto 1/3}_{\Gamma}$		0apggsscc	010010001_2	Bn{ 0 0 0 0 1 1 0 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	V 23

flip=False

{1, 2, 4}{1, 5, 3}{1, 7, 6}{2, 7, 3}{2, 6, 5}{3, 6, 4}{4, 7, 5}

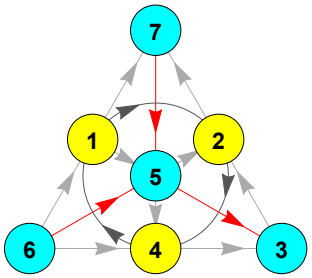
Fano plane



$$\begin{pmatrix} 1 & e_1 & e_2 & e_3 & e_4 & e_5 & e_6 & e_7 \\ e_1 & -1 & e_4 & -e_5 & -e_2 & e_3 & -e_7 & e_6 \\ e_2 & -e_4 & -1 & -e_7 & e_1 & -e_6 & e_5 & e_3 \\ e_3 & e_5 & e_7 & -1 & -e_6 & -e_1 & e_4 & -e_2 \\ e_4 & e_2 & -e_1 & e_6 & -1 & -e_7 & -e_3 & e_5 \\ e_5 & -e_3 & e_6 & e_1 & e_7 & -1 & -e_2 & -e_4 \\ e_6 & e_7 & -e_5 & -e_4 & e_3 & e_2 & -1 & -e_1 \\ e_7 & -e_6 & -e_3 & e_2 & -e_5 & e_4 & e_1 & -1 \end{pmatrix}$$

split=1

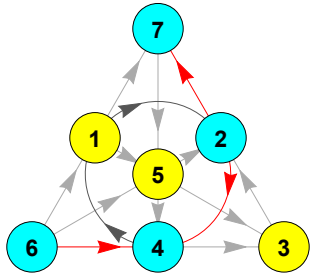
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	4	-5	-2	3	-7	6
2	-4	-1	-7	1	-6	5	3
3	5	7	1	-6	1	-4	2
4	2	-1	6	-1	-7	-3	5
5	-3	6	-1	7	1	2	4
6	7	-5	4	3	-2	1	1
7	-6	-3	-2	-5	-4	-1	1

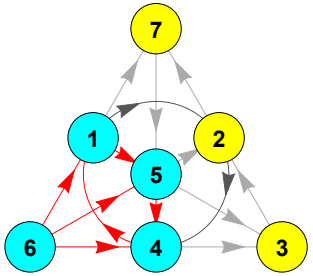
split=2

Fano plane



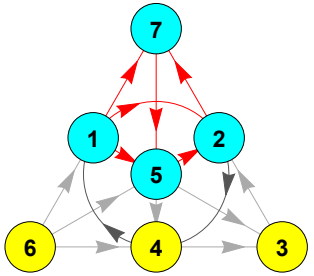
split=4

Fano plane



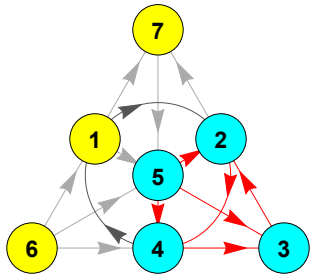
split=6

Fano plane



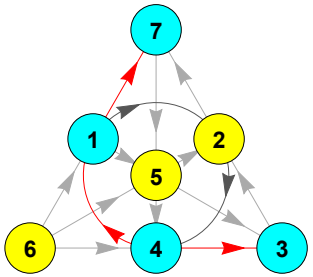
split=3

Fano plane



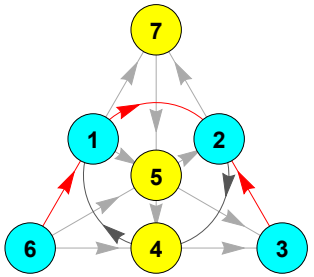
split=5

Fano plane



split=7

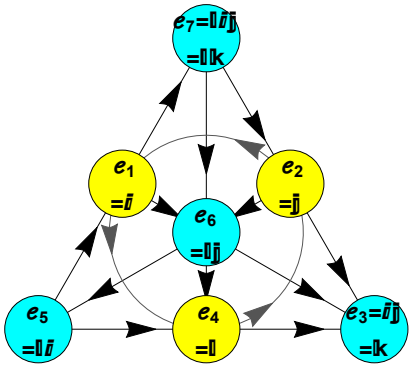
Fano plane



flip=True

{1, 4, 2}{1, 6, 3}{1, 7, 5}{2, 3, 7}{2, 6, 5}{3, 5, 4}{4, 7, 6}

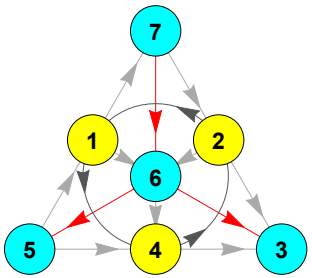
Fano plane



$$\begin{pmatrix} 1 & e_1 & e_2 & e_3 & e_4 & e_5 & e_6 & e_7 \\ e_1 & -1 & e_4 & e_6 & e_2 & -e_7 & e_3 & e_5 \\ e_2 & e_4 & -1 & e_7 & -e_1 & -e_6 & e_5 & -e_3 \\ e_3 & e_6 & -e_7 & -1 & -e_5 & e_4 & -e_1 & e_2 \\ e_4 & -e_2 & e_1 & e_5 & -1 & -e_3 & -e_7 & e_6 \\ e_5 & e_7 & e_6 & -e_4 & e_3 & -1 & -e_2 & -e_1 \\ e_6 & -e_3 & -e_5 & e_1 & e_7 & e_2 & -1 & -e_4 \\ e_7 & -e_5 & e_3 & -e_2 & -e_6 & e_1 & e_4 & -1 \end{pmatrix}$$

split=1

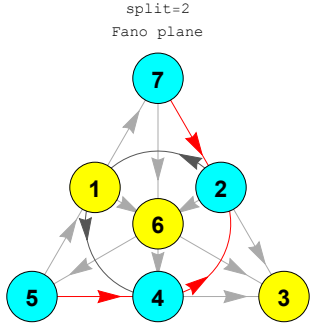
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	-6	2	-7	3	5
2	4	-1	7	-1	-6	5	-3
3	6	-7	1	-5	-4	1	-2
4	-2	1	5	-1	-3	-7	6
5	7	6	4	3	1	2	1
6	-3	-5	-1	7	-2	1	4
7	-5	3	2	-6	-1	-4	1

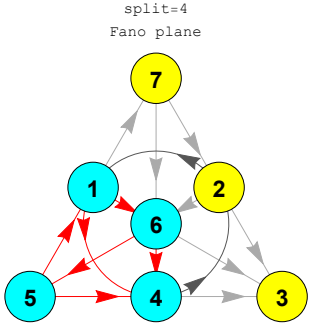
split=2

Fano plane



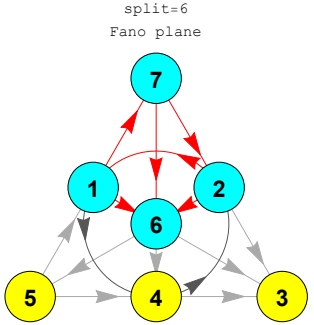
split=4

Fano plane



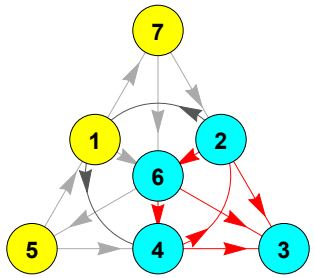
split=6

Fano plane



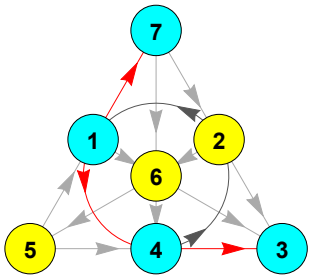
split=3

Fano plane



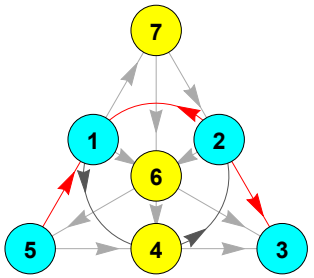
split=5

Fano plane



split=7

Fano plane

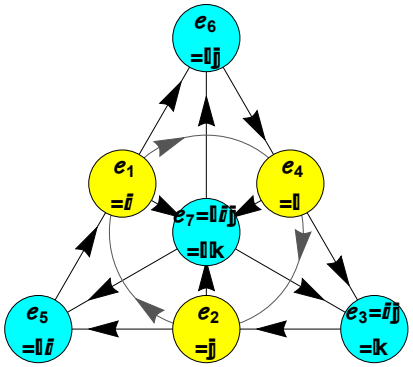


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
33	$\overline{\underset{c_d}{d}}^{\,\mapsto 1/3}_{L}$		0apggsscc 010010010_2	Bn{ 0 0 0 0 1 0 1 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Cl 17

flip=False

{1, 4, 2}{1, 7, 3}{1, 6, 5}{2, 5, 3}{2, 7, 6}{3, 6, 4}{4, 7, 5}

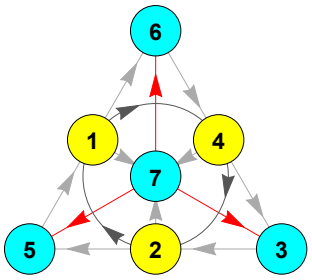
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_7$	e_2	$-e_6$	e_5	e_3
e_2	e_4	−1	$-e_5$	$-e_1$	e_3	$-e_7$	e_6
e_3	e_7	e_5	−1	$-e_6$	$-e_2$	e_4	$-e_1$
e_4	$-e_2$	e_1	e_6	−1	$-e_7$	$-e_3$	e_5
e_5	e_6	$-e_3$	e_2	e_7	−1	$-e_1$	$-e_4$
e_6	$-e_5$	e_7	$-e_4$	e_3	e_1	−1	$-e_2$
e_7	$-e_3$	$-e_6$	e_1	$-e_5$	e_4	e_2	−1

split=1

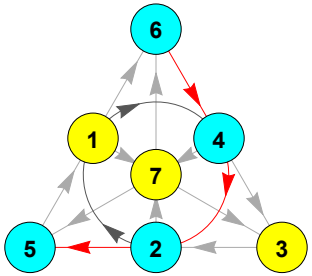
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−7	2	−6	5	3
2	4	−1	−5	−1	3	−7	6
3	7	5	1	−6	2	−4	1
4	−2	1	6	−1	−7	−3	5
5	6	−3	−2	7	1	1	4
6	−5	7	4	3	−1	1	2
7	−3	−6	−1	−5	−4	−2	1

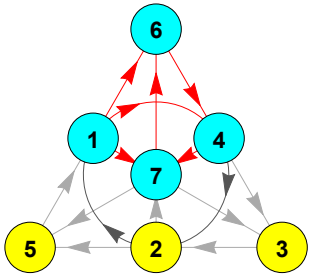
split=2

Fano plane



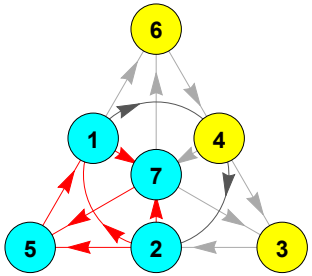
split=4

Fano plane



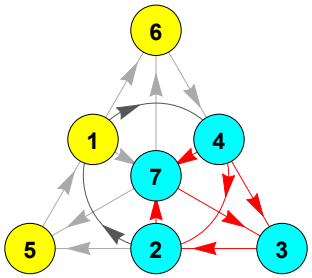
split=6

Fano plane



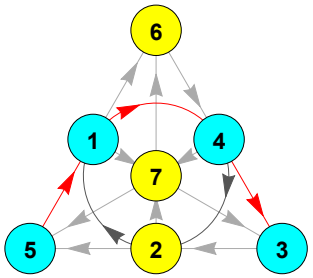
split=3

Fano plane



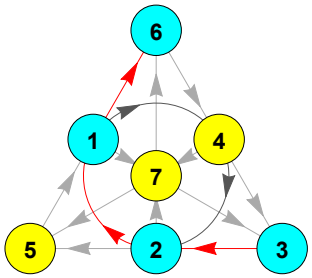
split=5

Fano plane



split=7

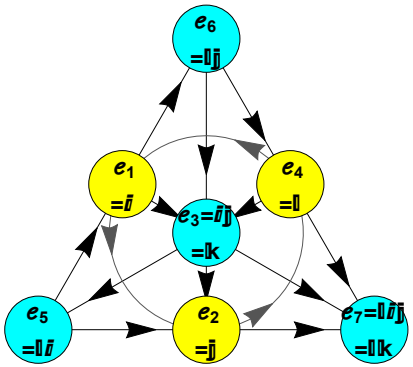
Fano plane



flip=True

{1, 2, 4}{1, 3, 7}{1, 6, 5}{2, 6, 3}{2, 7, 5}{3, 5, 4}{4, 7, 6}

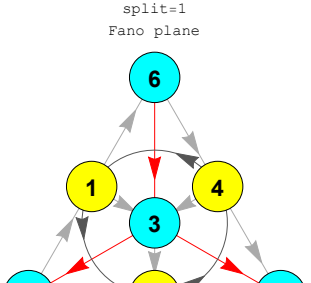
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_7	$-e_2$	$-e_6$	e_5	$-e_3$
e_2	$-e_4$	−1	$-e_6$	e_1	$-e_7$	e_3	e_5
e_3	$-e_7$	e_6	−1	$-e_5$	e_4	$-e_2$	e_1
e_4	e_2	$-e_1$	e_5	−1	$-e_3$	$-e_7$	e_6
e_5	e_6	e_7	$-e_4$	e_3	−1	$-e_1$	$-e_2$
e_6	$-e_5$	$-e_3$	e_2	e_7	e_1	−1	$-e_4$
e_7	e_3	$-e_5$	$-e_1$	$-e_6$	e_2	e_4	−1

split=1

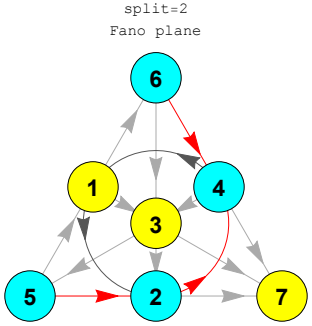
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	7	−2	−6	5	−3
2	−4	−1	−6	1	−7	3	5
3	−7	6	1	−5	−4	2	−1
4	2	−1	5	−1	−3	−7	6
5	6	7	4	3	1	1	2
6	−5	−3	−2	7	−1	1	4
7	3	−5	1	−6	−2	−4	1

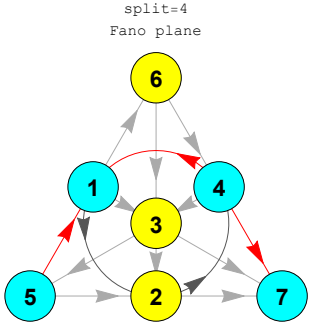
split=2

Fano plane



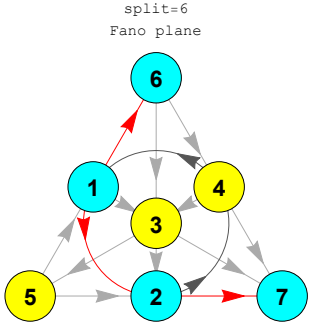
split=4

Fano plane



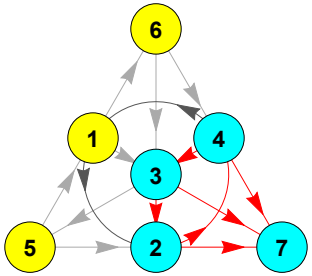
split=6

Fano plane



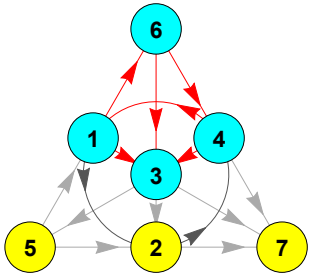
split=3

Fano plane



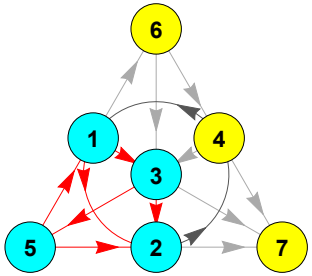
split=5

Fano plane



split=7

Fano plane

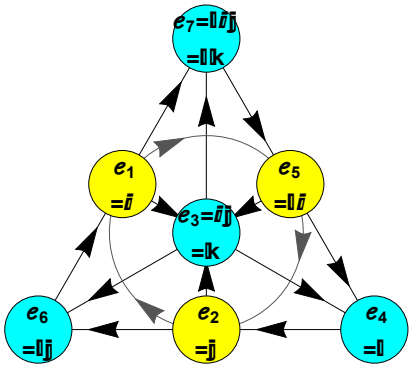


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
34	$\overline{d}_{m_d}^{1/3}$		0apggsscc 0100100011_2	Bn{ 0 0 0 0 1 0 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\overline{Hs}}$ 108

flip=False

{1, 5, 2}{1, 3, 4}{1, 7, 6}{2, 3, 7}{2, 6, 4}{3, 6, 5}{4, 7, 5}

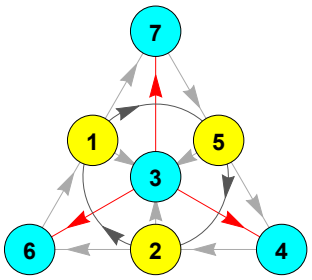
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_4	$-e_3$	e_2	$-e_7$	e_6
e_2	e_5	−1	e_7	$-e_6$	$-e_1$	e_4	$-e_3$
e_3	$-e_4$	$-e_7$	−1	e_1	$-e_6$	e_5	e_2
e_4	e_3	e_6	$-e_1$	−1	$-e_7$	$-e_2$	e_5
e_5	$-e_2$	e_1	e_6	e_7	−1	$-e_3$	$-e_4$
e_6	e_7	$-e_4$	$-e_5$	e_2	e_3	−1	$-e_1$
e_7	$-e_6$	e_3	$-e_2$	$-e_5$	e_4	e_1	−1

split=1

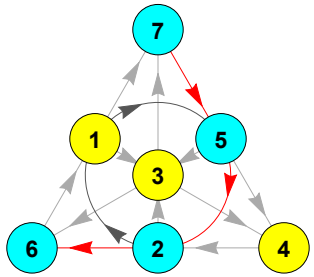
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	4	−3	2	−7	6
2	5	−1	7	−6	−1	4	−3
3	−4	−7	1	−1	−6	−5	−2
4	3	6	1	1	−7	2	−5
5	−2	1	6	7	−1	−3	−4
6	7	−4	5	−2	3	1	1
7	−6	3	2	5	4	−1	1

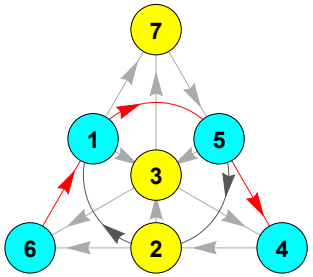
split=2

Fano plane



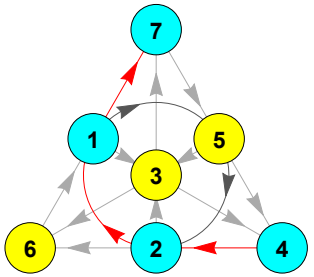
split=4

Fano plane



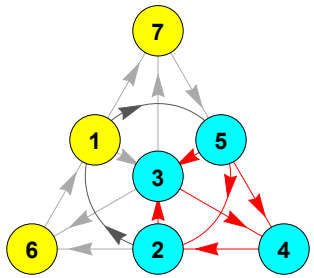
split=6

Fano plane



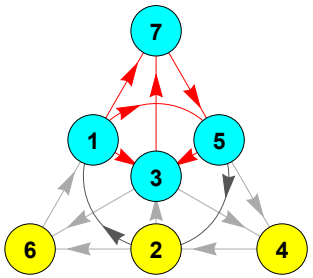
split=3

Fano plane



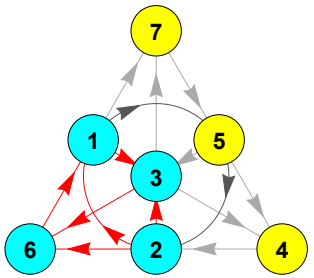
split=5

Fano plane



split=7

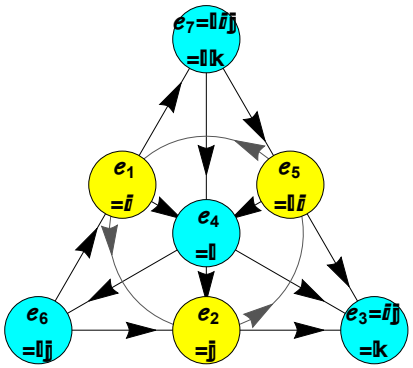
Fano plane



flip=True

{1, 2, 5}{1, 4, 3}{1, 7, 6}{2, 3, 6}{2, 7, 4}{3, 7, 5}{4, 6, 5}

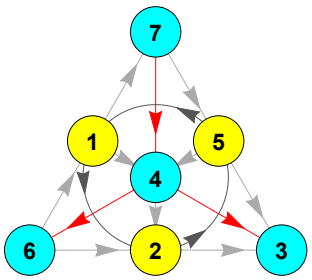
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	$-e_4$	e_3	$-e_2$	$-e_7$	e_6
e_2	$-e_5$	−1	e_6	$-e_7$	e_1	$-e_3$	e_4
e_3	e_4	$-e_6$	−1	$-e_1$	$-e_7$	e_2	e_5
e_4	$-e_3$	e_7	e_1	−1	$-e_6$	e_5	$-e_2$
e_5	e_2	$-e_1$	e_7	e_6	−1	$-e_4$	$-e_3$
e_6	e_7	e_3	$-e_2$	$-e_5$	e_4	−1	$-e_1$
e_7	$-e_6$	$-e_4$	$-e_5$	e_2	e_3	e_1	−1

split=1

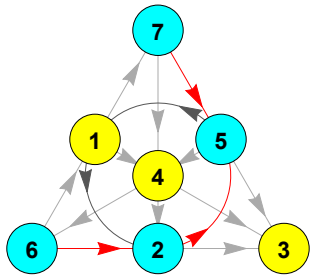
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−4	3	−2	−7	6
2	−5	−1	6	−7	1	−3	4
3	4	−6	1	1	−7	−2	−5
4	−3	7	−1	1	−6	−5	2
5	2	−1	7	6	−1	−4	−3
6	7	3	2	5	4	1	1
7	−6	−4	5	−2	3	−1	1

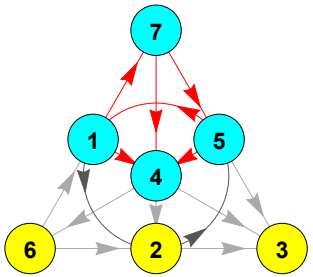
split=2

Fano plane



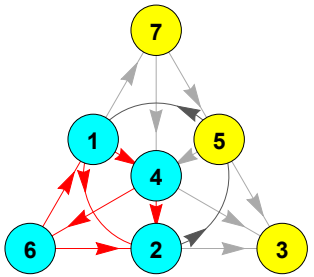
split=4

Fano plane



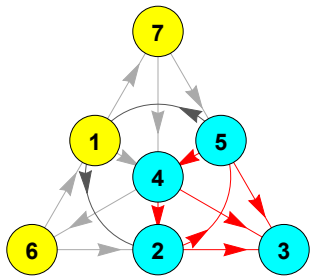
split=6

Fano plane



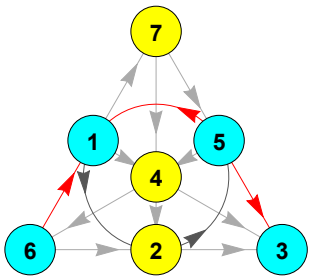
split=3

Fano plane



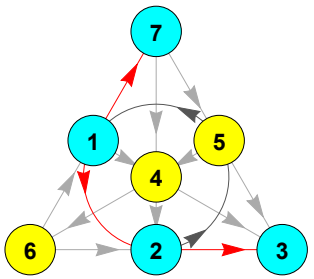
split=5

Fano plane



split=7

Fano plane

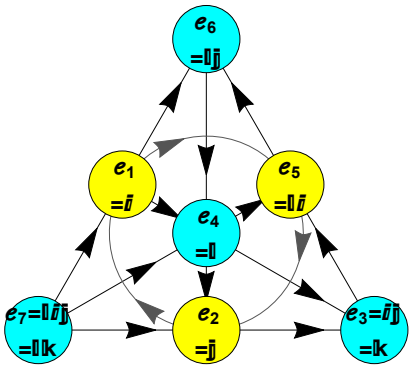


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
35	$u_{b_1}^{2/3}$	■ ◆	0apggsscc 001010111_2	Bn{ 0 0 0 0 0 1 1 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Na 11

flip=False

{1, 5, 2}{1, 4, 3}{1, 6, 7}{2, 3, 7}{2, 6, 4}{3, 5, 6}{4, 5, 7}

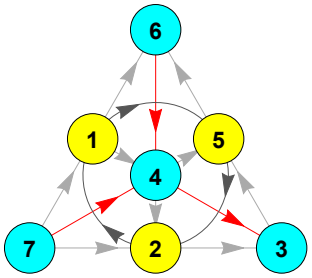
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_4$	e_3	e_2	e_7	$-e_6$
e_2	e_5	−1	e_7	$-e_6$	$-e_1$	e_4	$-e_3$
e_3	e_4	$-e_7$	−1	$-e_1$	e_6	$-e_5$	e_2
e_4	$-e_3$	e_6	e_1	−1	e_7	$-e_2$	$-e_5$
e_5	$-e_2$	e_1	$-e_6$	$-e_7$	−1	e_3	e_4
e_6	$-e_7$	$-e_4$	e_5	e_2	$-e_3$	−1	e_1
e_7	e_6	e_3	$-e_2$	e_5	$-e_4$	$-e_1$	−1

split=1

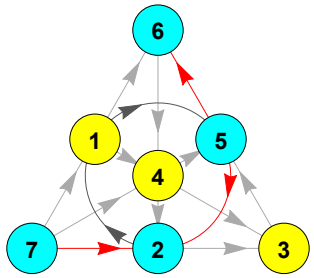
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−4	3	2	7	−6
2	5	−1	7	−6	−1	4	−3
3	4	−7	1	1	6	5	−2
4	−3	6	−1	1	7	2	5
5	−2	1	−6	−7	−1	3	4
6	−7	−4	−5	−2	−3	1	−1
7	6	3	2	−5	−4	1	1

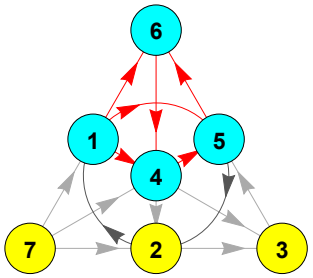
split=2

Fano plane



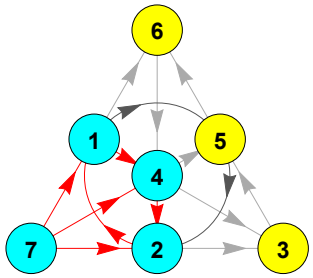
split=4

Fano plane



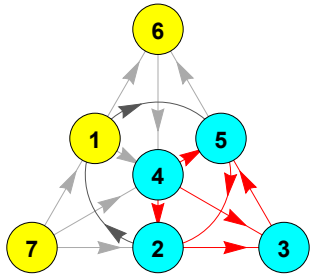
split=6

Fano plane



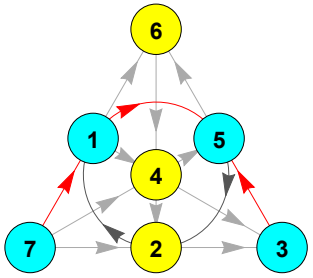
split=3

Fano plane



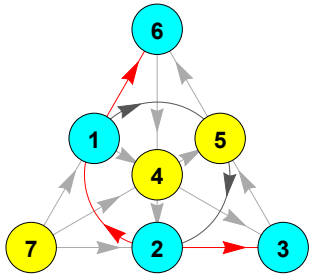
split=5

Fano plane



split=7

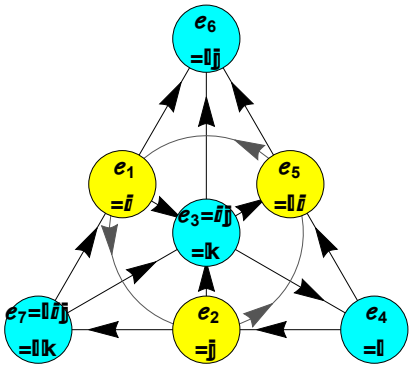
Fano plane



flip=True

{1, 2, 5}{1, 3, 4}{1, 6, 7}{2, 3, 6}{2, 7, 4}{3, 5, 7}{4, 5, 6}

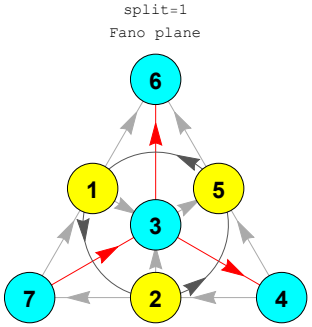
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_4	$-e_3$	$-e_2$	e_7	$-e_6$
e_2	$-e_5$	−1	e_6	$-e_7$	e_1	$-e_3$	e_4
e_3	$-e_4$	$-e_6$	−1	e_1	e_7	e_2	$-e_5$
e_4	e_3	e_7	$-e_1$	−1	e_6	$-e_5$	$-e_2$
e_5	e_2	$-e_1$	$-e_7$	$-e_6$	−1	e_4	e_3
e_6	$-e_7$	e_3	$-e_2$	e_5	$-e_4$	−1	e_1
e_7	e_6	$-e_4$	e_5	e_2	$-e_3$	$-e_1$	−1

split=1

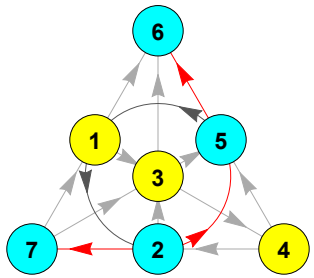
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	4	−3	−2	7	−6
2	−5	−1	6	−7	1	−3	4
3	−4	−6	1	−1	7	−2	5
4	3	7	1	1	6	5	2
5	2	−1	−7	−6	−1	4	3
6	−7	3	2	−5	−4	1	−1
7	6	−4	−5	−2	−3	1	1

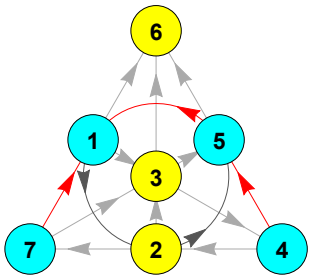
split=2

Fano plane



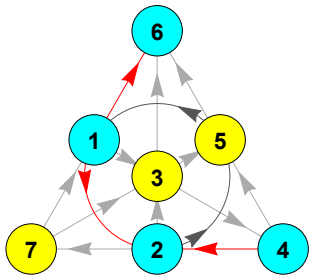
split=4

Fano plane



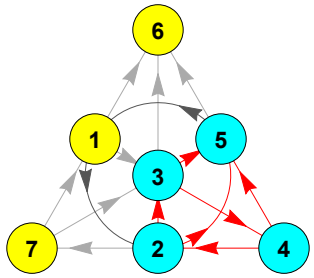
split=6

Fano plane



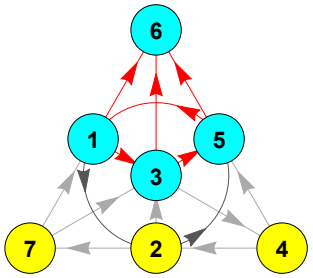
split=3

Fano plane



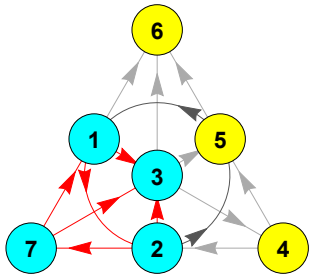
split=5

Fano plane



split=7

Fano plane

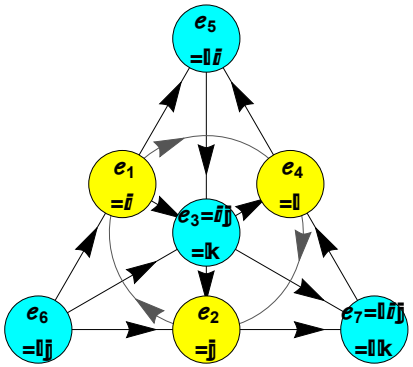


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
36	$u_{g_1}^{0\to 2/3}$		0apggsscc 001010110_2	Bn{ 0 0 0 0 0 1 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\overline{Mt}}$ 109

flip=False

{1, 4, 2}{1, 3, 7}{1, 5, 6}{2, 5, 3}{2, 7, 6}{3, 4, 6}{4, 5, 7}

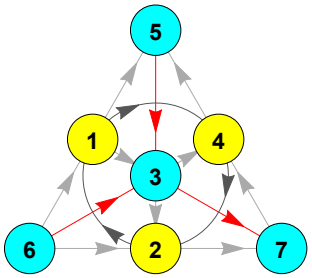
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_7	e_2	e_6	$-e_5$	$-e_3$
e_2	e_4	−1	$-e_5$	$-e_1$	e_3	$-e_7$	e_6
e_3	$-e_7$	e_5	−1	e_6	$-e_2$	$-e_4$	e_1
e_4	$-e_2$	e_1	$-e_6$	−1	e_7	e_3	$-e_5$
e_5	$-e_6$	$-e_3$	e_2	$-e_7$	−1	e_1	e_4
e_6	e_5	e_7	e_4	$-e_3$	$-e_1$	−1	$-e_2$
e_7	e_3	$-e_6$	$-e_1$	e_5	$-e_4$	e_2	−1

split=1

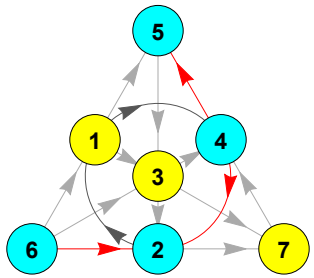
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	7	2	6	−5	−3
2	4	−1	−5	−1	3	−7	6
3	−7	5	1	6	2	4	−1
4	−2	1	−6	−1	7	3	−5
5	−6	−3	−2	−7	1	−1	−4
6	5	7	−4	−3	1	1	2
7	3	−6	1	5	4	−2	1

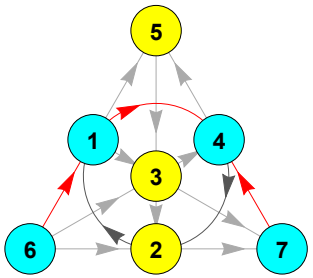
split=2

Fano plane



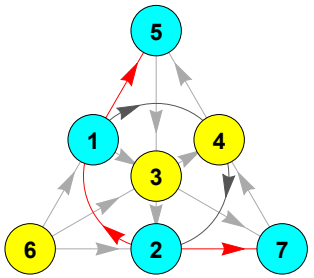
split=4

Fano plane



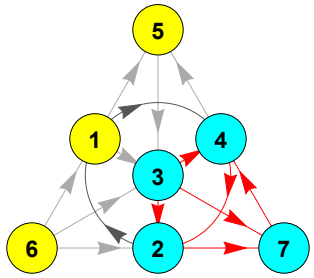
split=6

Fano plane



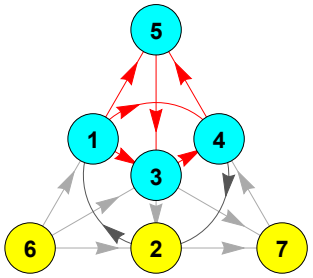
split=3

Fano plane



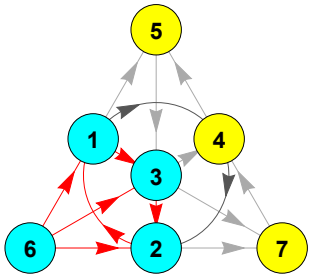
split=5

Fano plane



split=7

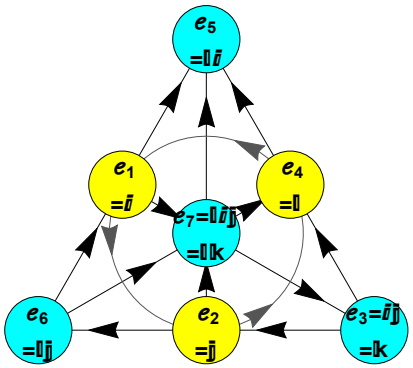
Fano plane



flip=True

{1, 2, 4}{1, 7, 3}{1, 5, 6}{2, 6, 3}{2, 7, 5}{3, 4, 5}{4, 6, 7}

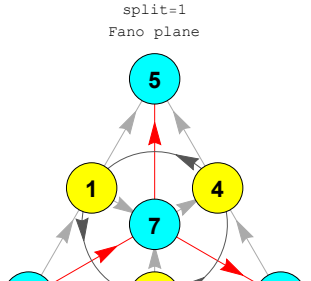
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_7$	$-e_2$	e_6	$-e_5$	e_3
e_2	$-e_4$	−1	$-e_6$	e_1	$-e_7$	e_3	e_5
e_3	e_7	e_6	−1	e_5	$-e_4$	$-e_2$	$-e_1$
e_4	e_2	$-e_1$	$-e_5$	−1	e_3	e_7	$-e_6$
e_5	$-e_6$	e_7	e_4	$-e_3$	−1	e_1	$-e_2$
e_6	e_5	e_3	$-e_2$	e_7	$-e_1$	−1	e_4
e_7	$-e_3$	$-e_5$	e_1	e_6	e_2	$-e_4$	−1

split=1

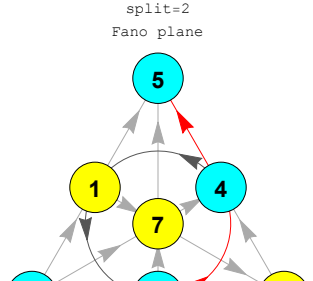
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−7	−2	6	−5	3
2	−4	−1	−6	1	−7	3	5
3	7	6	1	5	4	2	1
4	2	−1	−5	−1	3	7	−6
5	−6	7	−4	−3	1	−1	2
6	5	−3	−2	−7	1	1	−4
7	−3	−5	−1	6	−2	4	1

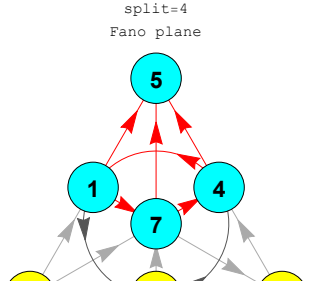
split=2

Fano plane



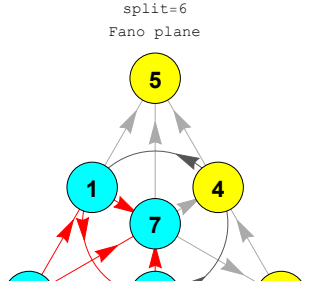
split=4

Fano plane



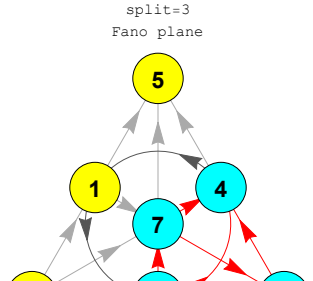
split=6

Fano plane



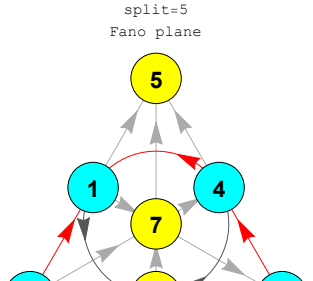
split=3

Fano plane



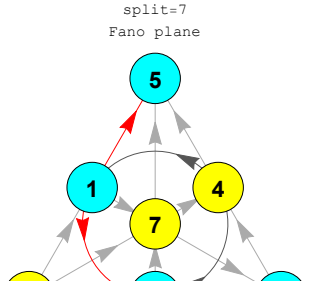
split=5

Fano plane



split=7

Fano plane

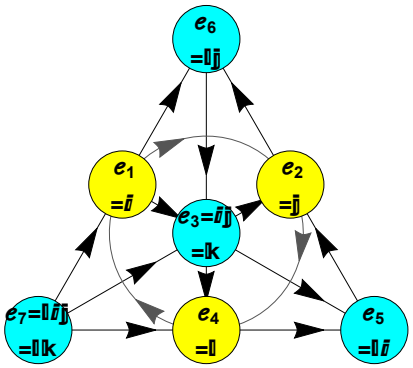


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
37	$u_{r_1}^{0\to 2/3}$		0apggsscc 001010101_2	Bn{ 0 0 0 0 0 0 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Rg}$ 111

flip=False

{1, 2, 4}{1, 3, 5}{1, 6, 7}{2, 7, 3}{2, 6, 5}{3, 4, 6}{4, 5, 7}

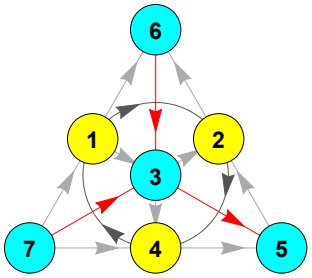
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_5	$-e_2$	$-e_3$	e_7	$-e_6$
e_2	$-e_4$	−1	$-e_7$	e_1	$-e_6$	e_5	e_3
e_3	$-e_5$	e_7	−1	e_6	e_1	$-e_4$	$-e_2$
e_4	e_2	$-e_1$	$-e_6$	−1	e_7	e_3	$-e_5$
e_5	e_3	e_6	$-e_1$	$-e_7$	−1	$-e_2$	e_4
e_6	$-e_7$	$-e_5$	e_4	$-e_3$	e_2	−1	e_1
e_7	e_6	$-e_3$	e_2	e_5	$-e_4$	$-e_1$	−1

split=1

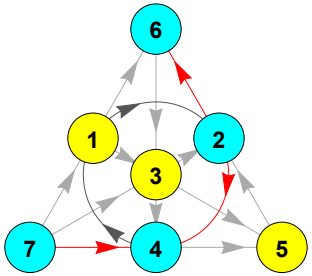
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	5	−2	−3	7	−6
2	−4	−1	−7	1	−6	5	3
3	−5	7	1	6	−1	4	2
4	2	−1	−6	−1	7	3	−5
5	3	6	1	−7	1	2	−4
6	−7	−5	−4	−3	−2	1	−1
7	6	−3	−2	5	4	1	1

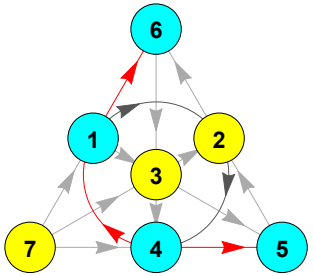
split=2

Fano plane



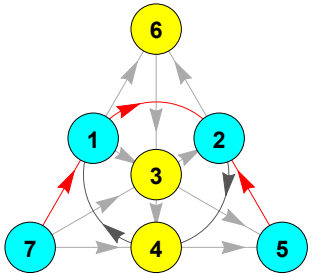
split=4

Fano plane



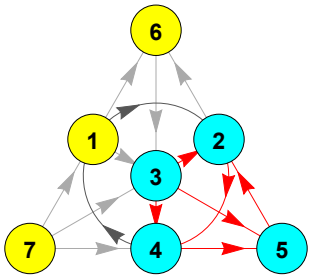
split=6

Fano plane



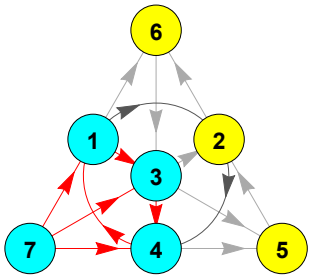
split=3

Fano plane



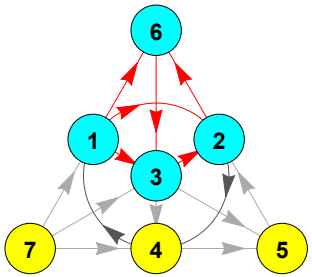
split=5

Fano plane



split=7

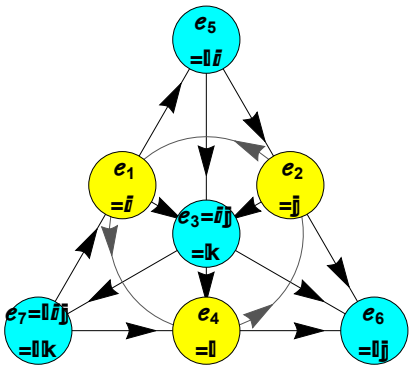
Fano plane



flip=True

{1, 4, 2}{1, 3, 6}{1, 5, 7}{2, 3, 7}{2, 6, 5}{3, 4, 5}{4, 6, 7}

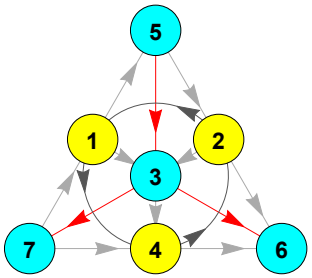
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_6	e_2	e_7	$-e_3$	$-e_5$
e_2	e_4	−1	e_7	$-e_1$	$-e_6$	e_5	$-e_3$
e_3	$-e_6$	$-e_7$	−1	e_5	$-e_4$	e_1	e_2
e_4	$-e_2$	e_1	$-e_5$	−1	e_3	e_7	$-e_6$
e_5	$-e_7$	e_6	e_4	$-e_3$	−1	$-e_2$	e_1
e_6	e_3	$-e_5$	$-e_1$	$-e_7$	e_2	−1	e_4
e_7	e_5	e_3	$-e_2$	e_6	$-e_1$	$-e_4$	−1

split=1

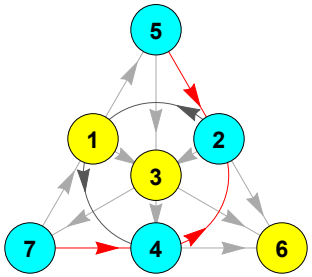
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	6	2	7	−3	−5
2	4	−1	7	−1	−6	5	−3
3	−6	−7	1	5	4	−1	−2
4	−2	1	−5	−1	3	7	−6
5	−7	6	−4	−3	1	2	−1
6	3	−5	1	−7	−2	1	−4
7	5	3	2	6	1	4	1

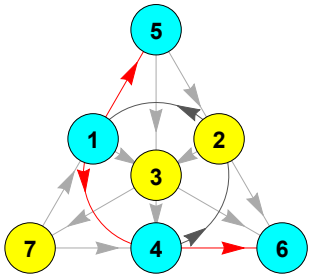
split=2

Fano plane



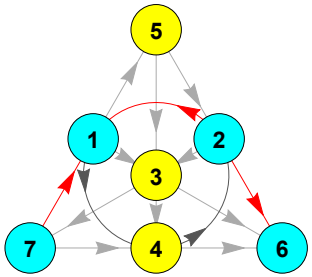
split=4

Fano plane



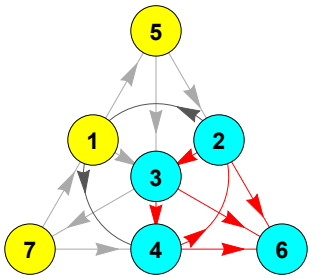
split=6

Fano plane



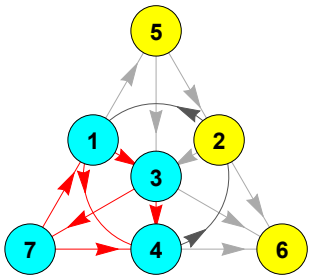
split=3

Fano plane



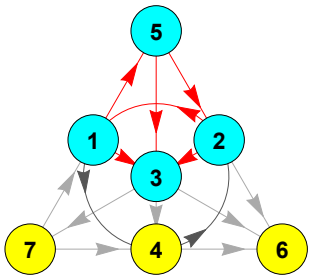
split=5

Fano plane



split=7

Fano plane

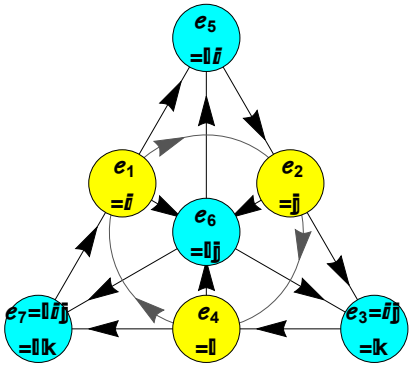


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates								Ele #
38	$\overline{W}_{bm}^{0}$		0apggsscc	011001111_2	Bn{	1	1	1	0	0	0	0	}	$\overline{W}$
					E8{	-1	-1	0	0	0	0	0	}	74

flip=False

{1, 2, 4}{1, 6, 3}{1, 5, 7}{2, 3, 5}{2, 6, 7}{3, 4, 7}{4, 6, 5}

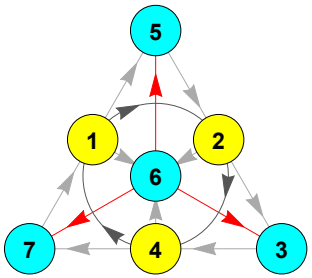
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_4	$-e_6$	$-e_2$	e_7	e_3	$-e_5$
e_2	$-e_4$	-1	e_5	e_1	$-e_3$	e_7	$-e_6$
e_3	e_6	$-e_5$	-1	e_7	e_2	$-e_1$	$-e_4$
e_4	e_2	$-e_1$	$-e_7$	-1	$-e_6$	e_5	e_3
e_5	$-e_7$	e_3	$-e_2$	e_6	-1	$-e_4$	e_1
e_6	$-e_3$	$-e_7$	e_1	$-e_5$	e_4	-1	e_2
e_7	e_5	e_6	e_4	$-e_3$	$-e_1$	$-e_2$	-1

split=1

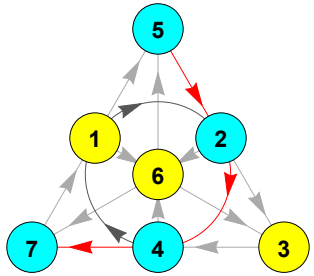
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	4	-6	-2	7	3	-5
2	-4	-1	5	1	-3	7	-6
3	6	-5	1	7	-2	1	4
4	2	-1	-7	-1	-6	5	3
5	-7	3	2	6	1	4	-1
6	-3	-7	-1	-5	-4	1	-2
7	5	6	-4	-3	1	2	1

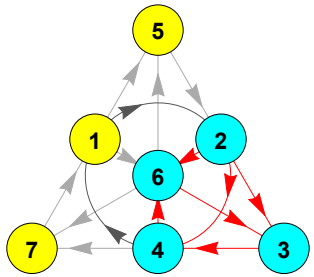
split=2

Fano plane



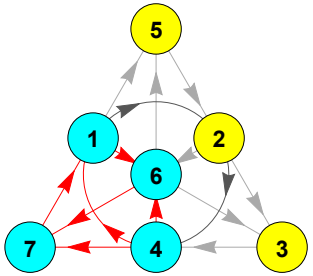
split=3

Fano plane



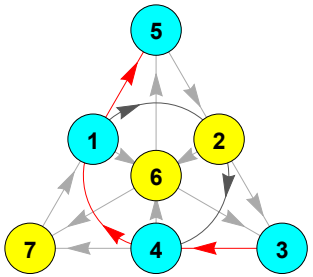
split=4

Fano plane



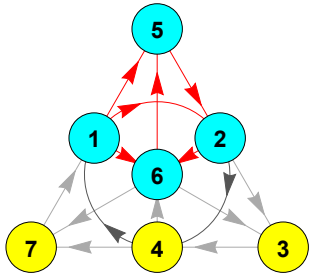
split=5

Fano plane



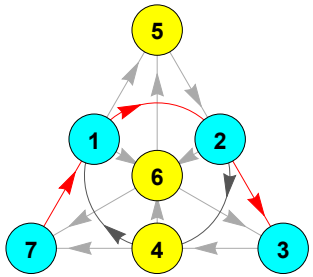
split=6

Fano plane



split=7

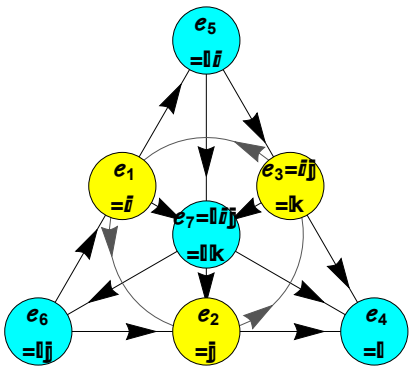
Fano plane



flip=True

{1, 2, 3}{1, 7, 4}{1, 5, 6}{2, 4, 6}{2, 5, 7}{3, 4, 5}{3, 7, 6}

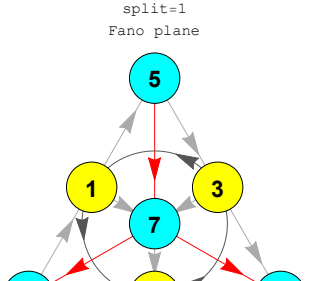
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	$-e_7$	e_6	$-e_5$	e_4
e_2	$-e_3$	-1	e_1	e_6	e_7	$-e_4$	$-e_5$
e_3	e_2	$-e_1$	-1	e_5	$-e_4$	$-e_7$	e_6
e_4	e_7	$-e_6$	$-e_5$	-1	e_3	e_2	$-e_1$
e_5	$-e_6$	$-e_7$	e_4	$-e_3$	-1	e_1	e_2
e_6	e_5	e_4	e_7	$-e_2$	$-e_1$	-1	$-e_3$
e_7	$-e_4$	e_5	$-e_6$	e_1	$-e_2$	e_3	-1

split=1

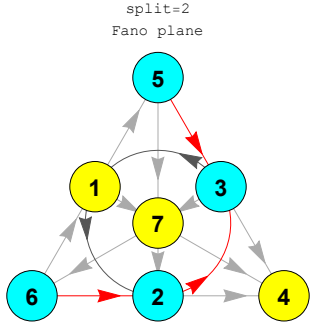
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	-7	6	-5	4
2	-3	-1	1	6	7	-4	-5
3	2	-1	-1	5	-4	-7	6
4	7	-6	-5	1	-3	-2	1
5	-6	-7	4	3	1	-1	-2
6	5	4	7	2	1	1	3
7	-4	5	-6	-1	2	-3	1

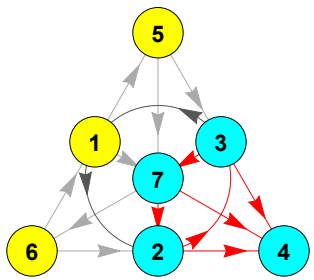
split=2

Fano plane



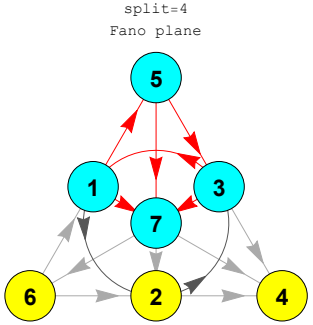
split=3

Fano plane



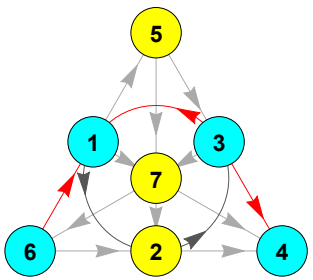
split=4

Fano plane



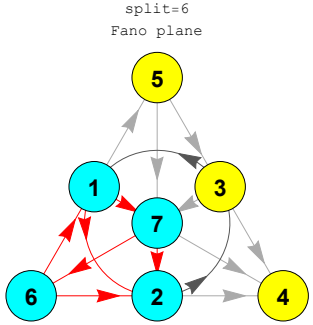
split=5

Fano plane



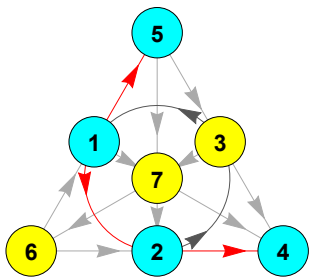
split=6

Fano plane



split=7

Fano plane

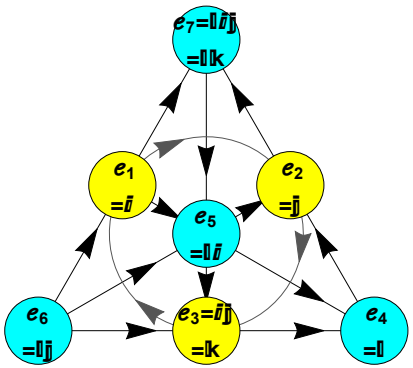


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
39	$\overline{e_{\mathrm{rm}}^{\mathrm{s}\phi}}_{L}^{0}$		0apggsscc 011001001_2	Bn{ E8{	1 -1	1 0	0 -1	1 0	0 0	0 0	0 0	0 0	} }	$\overline{Er}$ 68

flip=False

{1, 2, 3}{1, 5, 4}{1, 7, 6}{2, 7, 4}{2, 6, 5}{3, 4, 6}{3, 7, 5}

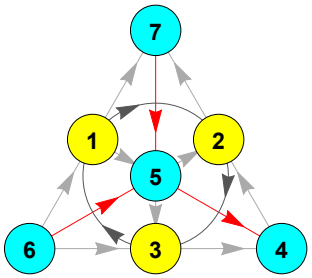
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	$-e_5$	e_4	$-e_7$	e_6
e_2	$-e_3$	-1	e_1	$-e_7$	$-e_6$	e_5	e_4
e_3	e_2	$-e_1$	-1	e_6	$-e_7$	$-e_4$	e_5
e_4	e_5	e_7	$-e_6$	-1	$-e_1$	e_3	$-e_2$
e_5	$-e_4$	e_6	e_7	e_1	-1	$-e_2$	$-e_3$
e_6	e_7	$-e_5$	e_4	$-e_3$	e_2	-1	$-e_1$
e_7	$-e_6$	$-e_4$	$-e_5$	e_2	e_3	e_1	-1

split=1

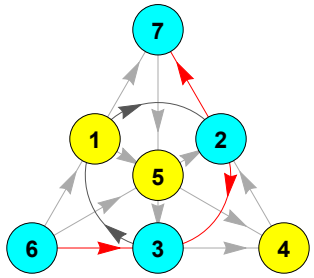
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	-5	4	-7	6
2	-3	-1	1	-7	-6	5	4
3	2	-1	-1	6	-7	-4	5
4	5	7	-6	1	1	-3	2
5	-4	6	7	-1	1	2	3
6	7	-5	4	3	-2	1	1
7	-6	-4	-5	-2	-3	-1	1

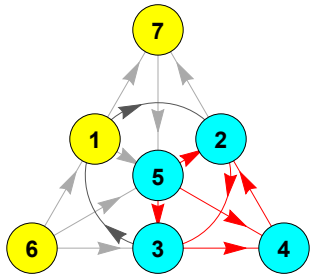
split=2

Fano plane



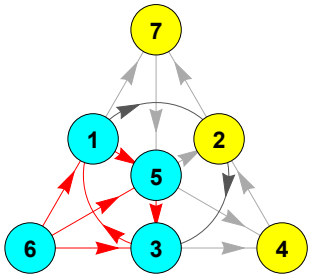
split=3

Fano plane



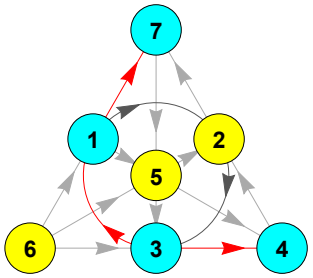
split=4

Fano plane



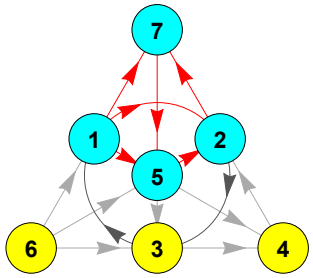
split=5

Fano plane



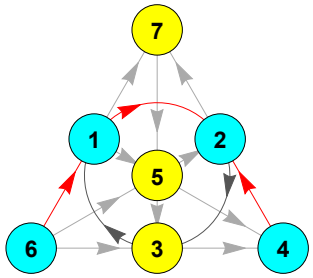
split=6

Fano plane



split=7

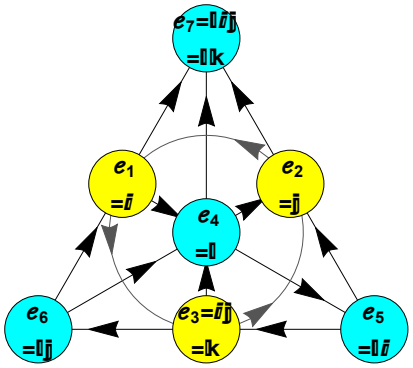
Fano plane



flip=True

{1, 3, 2}{1, 4, 5}{1, 7, 6}{2, 6, 4}{2, 7, 5}{3, 4, 7}{3, 6, 5}

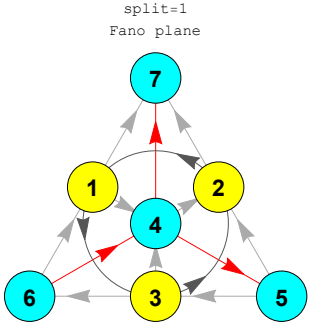
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	e_5	$-e_4$	$-e_7$	e_6
e_2	e_3	-1	$-e_1$	$-e_6$	$-e_7$	e_4	e_5
e_3	$-e_2$	e_1	-1	e_7	$-e_6$	e_5	$-e_4$
e_4	$-e_5$	e_6	$-e_7$	-1	e_1	$-e_2$	e_3
e_5	e_4	e_7	e_6	$-e_1$	-1	$-e_3$	$-e_2$
e_6	e_7	$-e_4$	$-e_5$	e_2	e_3	-1	$-e_1$
e_7	$-e_6$	$-e_5$	e_4	$-e_3$	e_2	e_1	-1

split=1

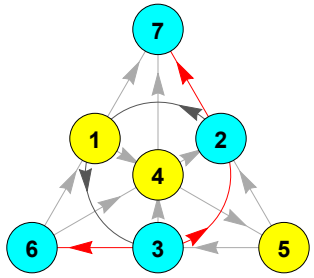
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	5	-4	-7	6
2	3	-1	-1	-6	-7	4	5
3	-2	1	-1	7	-6	5	-4
4	-5	6	-7	1	-1	2	-3
5	4	7	6	1	1	3	2
6	7	-4	-5	-2	-3	1	1
7	-6	-5	4	3	-2	-1	1

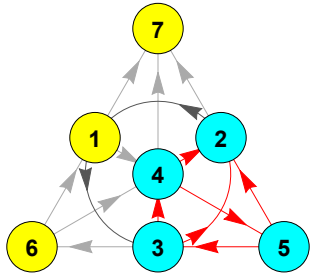
split=2

Fano plane



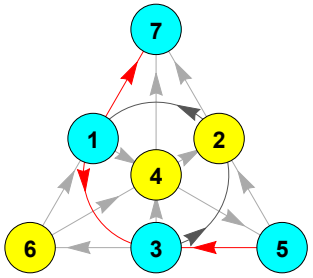
split=3

Fano plane



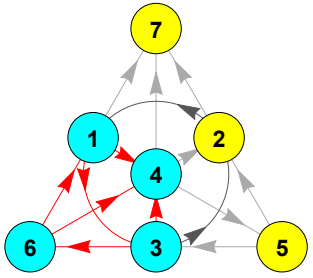
split=4

Fano plane



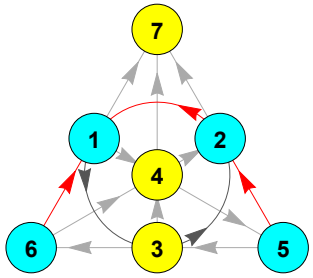
split=5

Fano plane



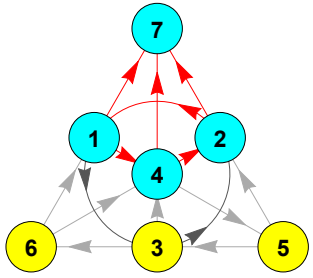
split=6

Fano plane



split=7

Fano plane

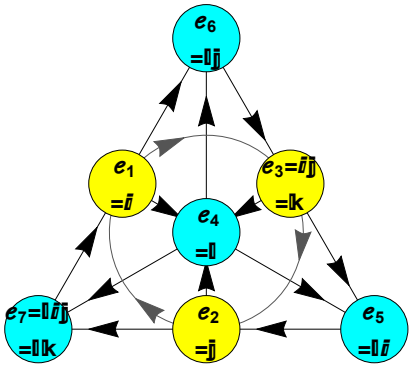


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
40	$e_{S}\phi_{r_1}^{0\to1}$		0apggsscc	Bn{	1	1	0	0	1	0	0	0	}	$\overline{\text{Sm}}$
			001000101_2	E8{	-1	0	0	-1	0	0	0	0	}	62

flip=False

{1, 3, 2}{1, 4, 5}{1, 6, 7}{2, 4, 6}{2, 7, 5}{3, 4, 7}{3, 5, 6}

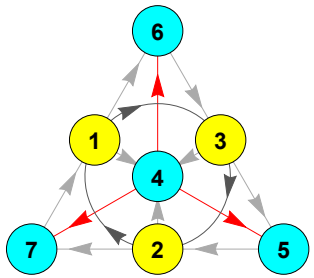
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	e_5	$-e_4$	e_7	$-e_6$
e_2	e_3	-1	$-e_1$	e_6	$-e_7$	$-e_4$	e_5
e_3	$-e_2$	e_1	-1	e_7	e_6	$-e_5$	$-e_4$
e_4	$-e_5$	$-e_6$	$-e_7$	-1	e_1	e_2	e_3
e_5	e_4	e_7	$-e_6$	$-e_1$	-1	e_3	$-e_2$
e_6	$-e_7$	e_4	e_5	$-e_2$	$-e_3$	-1	e_1
e_7	e_6	$-e_5$	e_4	$-e_3$	e_2	$-e_1$	-1

split=1

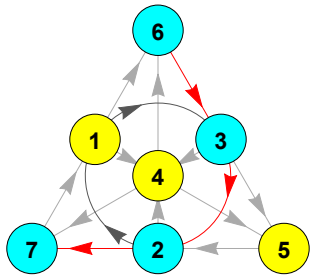
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	5	-4	7	-6
2	3	-1	-1	6	-7	-4	5
3	-2	1	-1	7	6	-5	-4
4	-5	-6	-7	1	-1	-2	-3
5	4	7	-6	1	1	-3	2
6	-7	4	5	2	3	1	-1
7	6	-5	4	3	-2	1	1

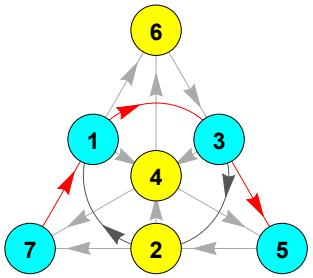
split=2

Fano plane



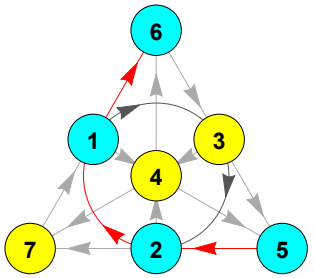
split=4

Fano plane



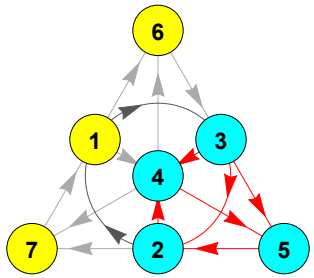
split=6

Fano plane



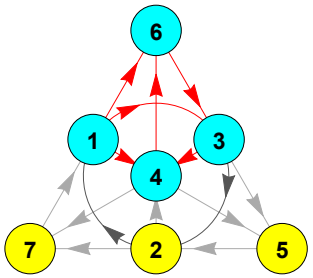
split=3

Fano plane



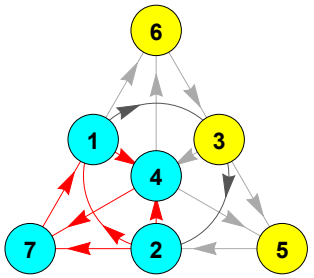
split=5

Fano plane



split=7

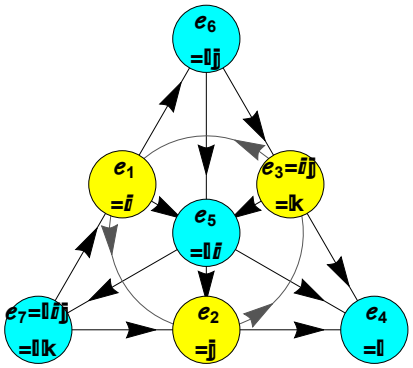
Fano plane



flip=True

{1, 2, 3}{1, 5, 4}{1, 6, 7}{2, 4, 7}{2, 6, 5}{3, 4, 6}{3, 5, 7}

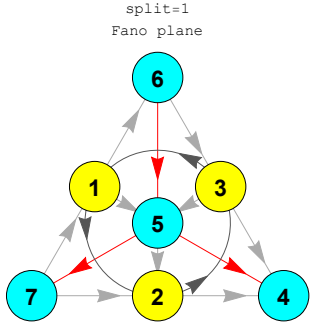
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	$-e_5$	e_4	e_7	$-e_6$
e_2	$-e_3$	-1	e_1	e_7	$-e_6$	e_5	$-e_4$
e_3	e_2	$-e_1$	-1	e_6	e_7	$-e_4$	$-e_5$
e_4	e_5	$-e_7$	$-e_6$	-1	$-e_1$	e_3	e_2
e_5	$-e_4$	e_6	$-e_7$	e_1	-1	$-e_2$	e_3
e_6	$-e_7$	$-e_5$	e_4	$-e_3$	e_2	-1	e_1
e_7	e_6	e_4	e_5	$-e_2$	$-e_3$	$-e_1$	-1

split=1

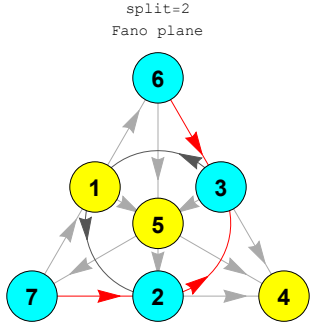
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	-5	4	7	-6
2	-3	-1	1	7	-6	5	-4
3	2	-1	-1	6	7	-4	-5
4	5	-7	-6	1	1	-3	-2
5	-4	6	-7	-1	1	2	-3
6	-7	-5	4	3	-2	1	-1
7	6	4	5	2	3	1	1

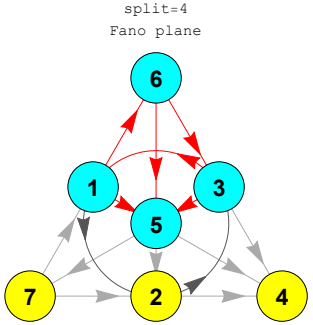
split=2

Fano plane



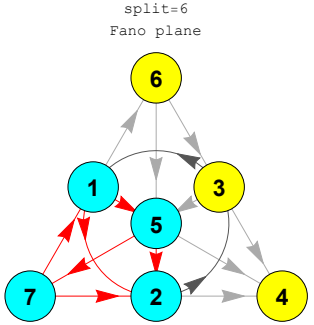
split=4

Fano plane



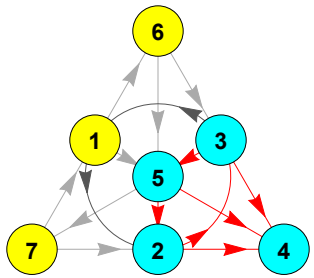
split=6

Fano plane



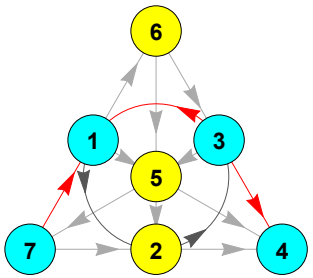
split=3

Fano plane



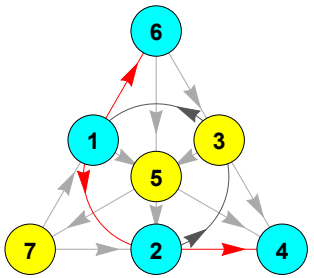
split=5

Fano plane



split=7

Fano plane

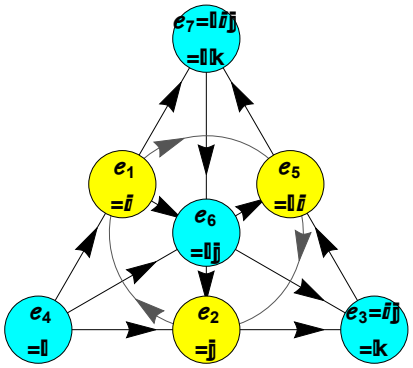


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
41	$\overline{V_{wm}^{\mu}}^{0}_{t}$		0apggsscc 011101000_2	Bn{ E8{	1 -1	1 0	0 0	0 0	0 -1	1 0	0 0	0 0	} }	$\overline{Cs}$ 55

flip=False

{1, 5, 2}{1, 6, 3}{1, 7, 4}{2, 3, 4}{2, 7, 6}{3, 5, 7}{4, 6, 5}

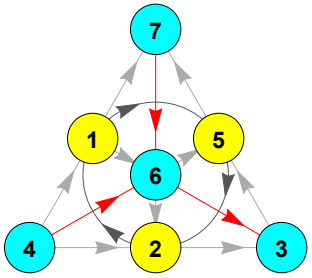
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_5$	$-e_6$	$-e_7$	e_2	e_3	e_4
e_2	e_5	-1	e_4	$-e_3$	$-e_1$	$-e_7$	e_6
e_3	e_6	$-e_4$	-1	e_2	e_7	$-e_1$	$-e_5$
e_4	e_7	e_3	$-e_2$	-1	$-e_6$	e_5	$-e_1$
e_5	$-e_2$	e_1	$-e_7$	e_6	-1	$-e_4$	e_3
e_6	$-e_3$	e_7	e_1	$-e_5$	e_4	-1	$-e_2$
e_7	$-e_4$	$-e_6$	e_5	e_1	$-e_3$	e_2	-1

split=1

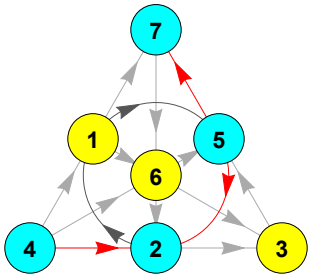
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-5	-6	-7	2	3	4
2	5	-1	4	-3	-1	-7	6
3	6	-4	1	-2	7	1	5
4	7	3	2	1	-6	-5	1
5	-2	1	-7	6	-1	-4	3
6	-3	7	-1	5	4	1	2
7	-4	-6	-5	-1	-3	-2	1

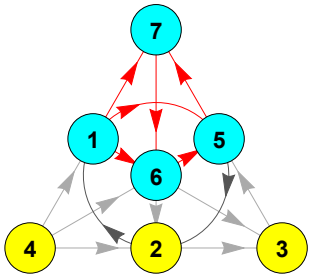
split=2

Fano plane



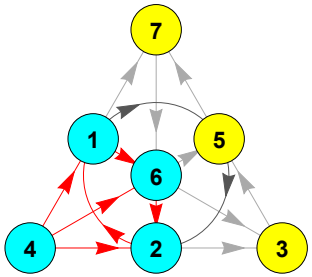
split=4

Fano plane



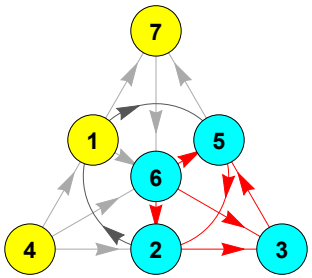
split=6

Fano plane



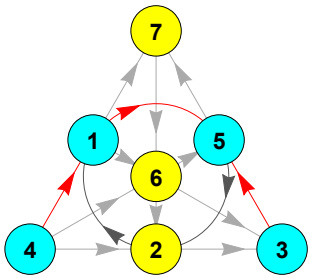
split=3

Fano plane



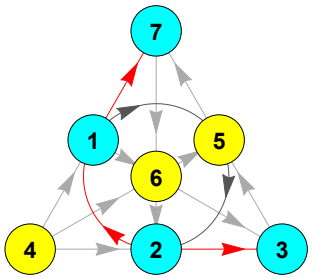
split=5

Fano plane



split=7

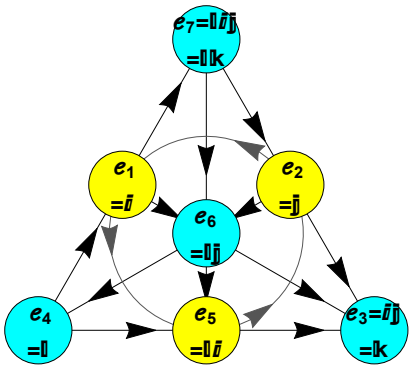
Fano plane



flip=True

{1, 5, 2}{1, 6, 3}{1, 7, 4}{2, 3, 7}{2, 6, 4}{3, 4, 5}{5, 7, 6}

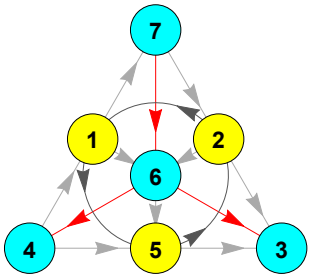
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_5$	$-e_6$	$-e_7$	e_2	e_3	e_4
e_2	e_5	-1	e_7	$-e_6$	$-e_1$	e_4	$-e_3$
e_3	e_6	$-e_7$	-1	e_5	$-e_4$	$-e_1$	e_2
e_4	e_7	e_6	$-e_5$	-1	e_3	$-e_2$	$-e_1$
e_5	$-e_2$	e_1	e_4	$-e_3$	-1	$-e_7$	e_6
e_6	$-e_3$	$-e_4$	e_1	e_2	e_7	-1	$-e_5$
e_7	$-e_4$	e_3	$-e_2$	e_1	$-e_6$	e_5	-1

split=1

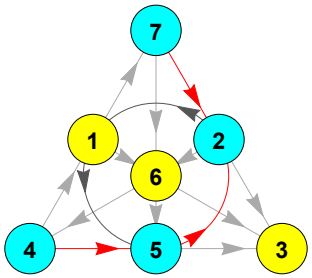
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-5	-6	-7	2	3	4
2	5	-1	7	-6	-1	4	-3
3	6	-7	1	-5	-4	1	-2
4	7	6	5	1	3	2	1
5	-2	1	4	-3	-1	-7	6
6	-3	-4	-1	-2	7	1	5
7	-4	3	2	-1	-6	-5	1

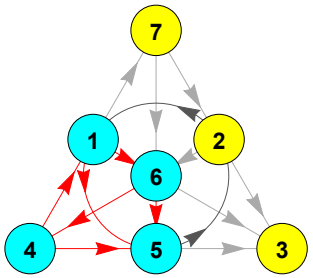
split=2

Fano plane



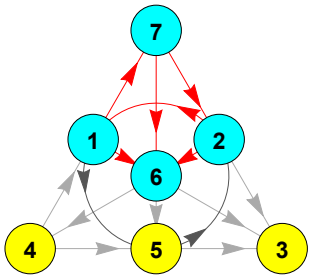
split=4

Fano plane



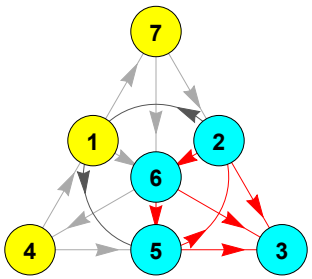
split=6

Fano plane



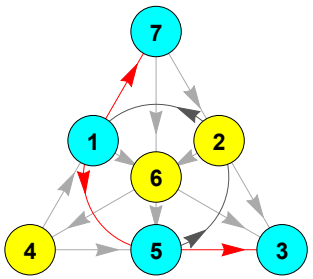
split=3

Fano plane



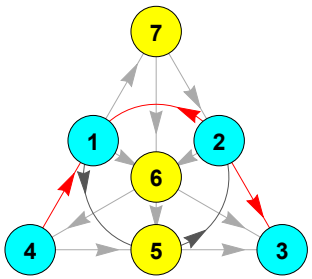
split=5

Fano plane



split=7

Fano plane

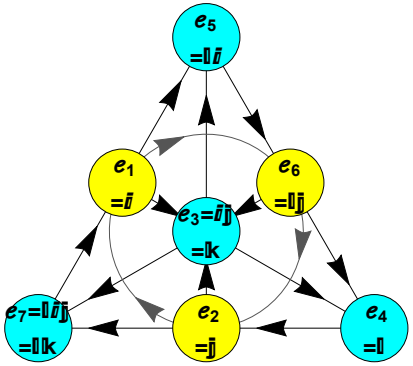


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
42	$s_{\omega_m}^{\vec{R}\to -1/3}$		0apggsscc 0001011101_2	Bn{ 1 1 0 0 0 0 1 0 } E8{ -1 0 0 0 0 -1 0 0 }	$\overline{\text{In}}$ 49

flip=False

{1, 6, 2}{1, 3, 4}{1, 5, 7}{2, 3, 5}{2, 7, 4}{3, 7, 6}{4, 5, 6}

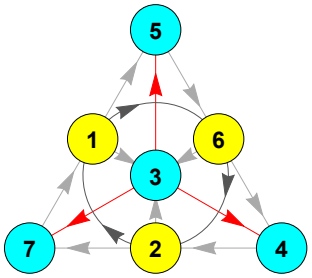
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_6$	e_4	$-e_3$	e_7	e_2	$-e_5$
e_2	e_6	-1	e_5	$-e_7$	$-e_3$	$-e_1$	e_4
e_3	$-e_4$	$-e_5$	-1	e_1	e_2	$-e_7$	e_6
e_4	e_3	e_7	$-e_1$	-1	e_6	$-e_5$	$-e_2$
e_5	$-e_7$	e_3	$-e_2$	$-e_6$	-1	e_4	e_1
e_6	$-e_2$	e_1	e_7	e_5	$-e_4$	-1	$-e_3$
e_7	e_5	$-e_4$	$-e_6$	e_2	$-e_1$	e_3	-1

split=1

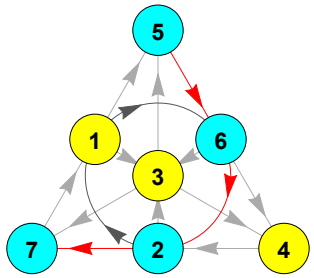
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	4	-3	7	2	-5
2	6	-1	5	-7	-3	-1	4
3	-4	-5	1	-1	-2	-7	-6
4	3	7	1	1	-6	-5	2
5	-7	3	2	6	1	4	-1
6	-2	1	7	5	-4	-1	-3
7	5	-4	6	-2	1	3	1

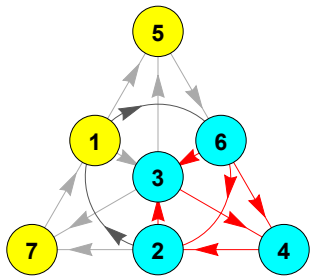
split=2

Fano plane



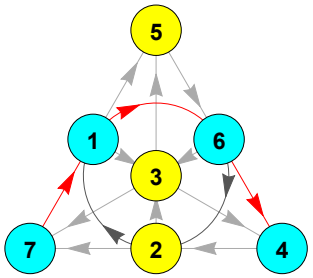
split=3

Fano plane



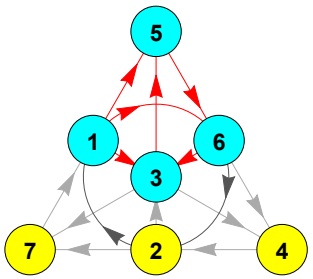
split=4

Fano plane



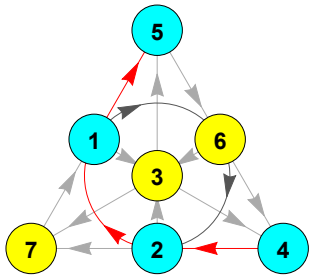
split=5

Fano plane



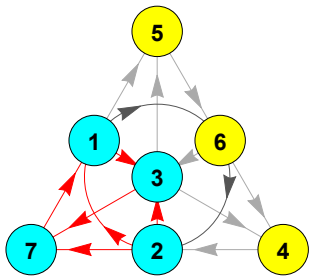
split=6

Fano plane



split=7

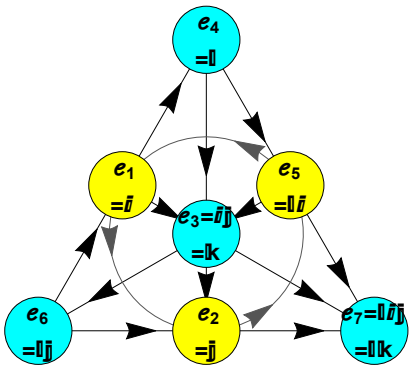
Fano plane



flip=True

{1, 2, 5}{1, 3, 7}{1, 4, 6}{2, 4, 3}{2, 7, 6}{3, 6, 5}{4, 5, 7}

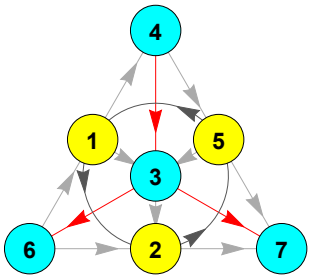
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	e_7	e_6	$-e_2$	$-e_4$	$-e_3$
e_2	$-e_5$	-1	$-e_4$	e_3	e_1	$-e_7$	e_6
e_3	$-e_7$	e_4	-1	$-e_2$	$-e_6$	e_5	e_1
e_4	$-e_6$	$-e_3$	e_2	-1	e_7	e_1	$-e_5$
e_5	e_2	$-e_1$	e_6	$-e_7$	-1	$-e_3$	e_4
e_6	e_4	e_7	$-e_5$	$-e_1$	e_3	-1	$-e_2$
e_7	e_3	$-e_6$	$-e_1$	e_5	$-e_4$	e_2	-1

split=1

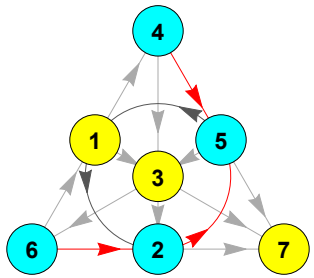
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	7	6	-2	-4	-3
2	-5	-1	-4	3	1	-7	6
3	-7	4	1	2	-6	-5	-1
4	-6	-3	-2	1	7	-1	5
5	2	-1	6	-7	-1	-3	4
6	4	7	5	1	3	1	2
7	3	-6	1	-5	-4	-2	1

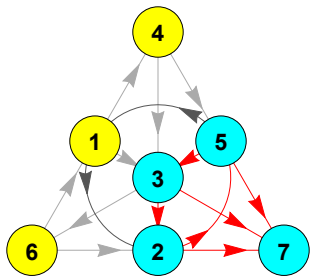
split=2

Fano plane



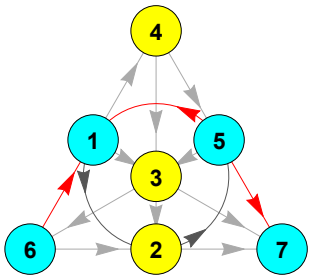
split=3

Fano plane



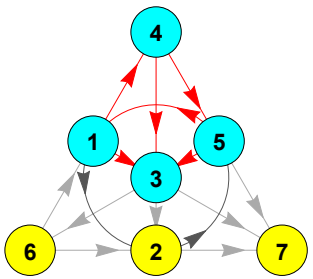
split=4

Fano plane



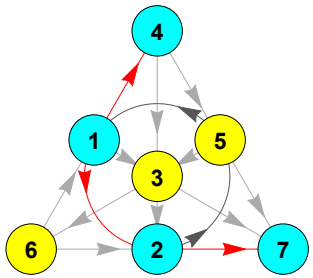
split=5

Fano plane



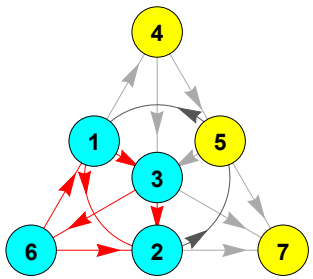
split=6

Fano plane



split=7

Fano plane

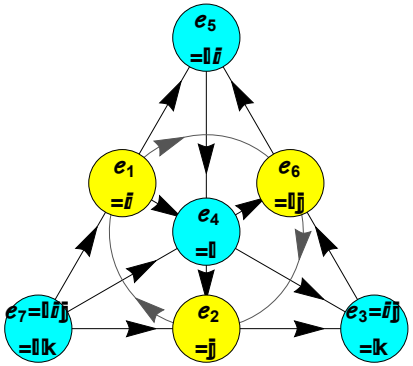


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
43	$s_{Cm}^{\vec{R}\to -1/3}$	■	0apggsscc	Bn{	1	1	0	0	0	0	0	1 }	$\overline{Tc}$
			0001011110_2	E8{	-1	0	0	0	0	0	-1	0 }	43

flip=False

{1, 6, 2}{1, 4, 3}{1, 5, 7}{2, 3, 7}{2, 5, 4}{3, 6, 5}{4, 6, 7}

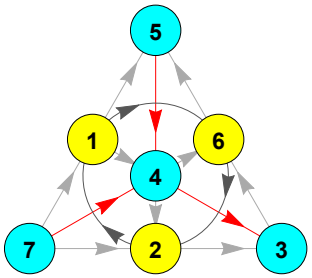
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_4$	e_3	e_7	e_2	$-e_5$
e_2	e_6	-1	e_7	$-e_5$	e_4	$-e_1$	$-e_3$
e_3	e_4	$-e_7$	-1	$-e_1$	$-e_6$	e_5	e_2
e_4	$-e_3$	e_5	e_1	-1	$-e_2$	e_7	$-e_6$
e_5	$-e_7$	$-e_4$	e_6	e_2	-1	$-e_3$	e_1
e_6	$-e_2$	e_1	$-e_5$	$-e_7$	e_3	-1	e_4
e_7	e_5	e_3	$-e_2$	e_6	$-e_1$	$-e_4$	-1

split=1

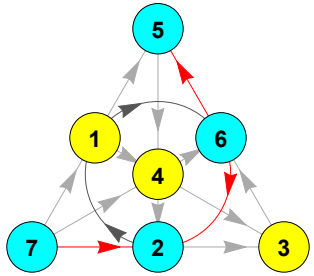
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	-4	3	7	2	-5
2	6	-1	7	-5	4	-1	-3
3	4	-7	1	1	6	5	-2
4	-3	5	-1	1	2	7	6
5	-7	-4	-6	-2	1	-3	-1
6	-2	1	-5	-7	3	-1	4
7	5	3	2	-6	1	-4	1

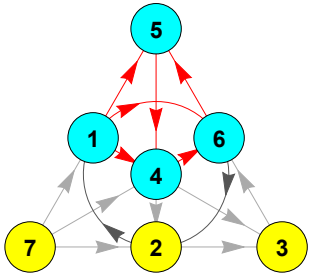
split=2

Fano plane



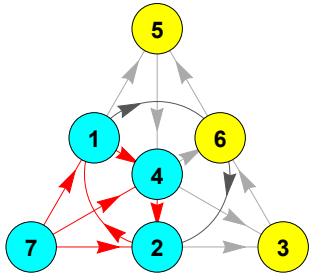
split=4

Fano plane



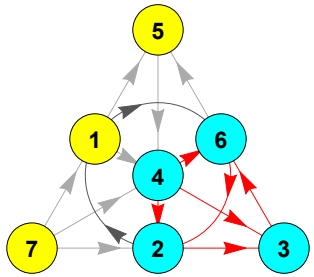
split=6

Fano plane



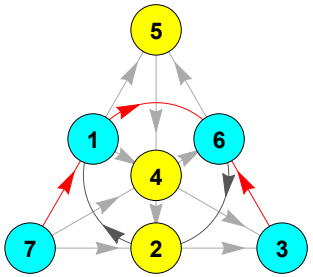
split=3

Fano plane



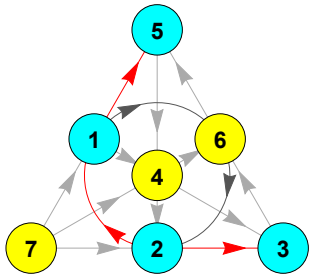
split=5

Fano plane



split=7

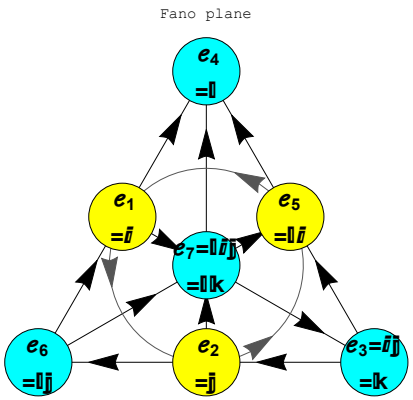
Fano plane



flip=True

{1, 2, 5}{1, 7, 3}{1, 4, 6}{2, 6, 3}{2, 7, 4}{3, 5, 4}{5, 6, 7}

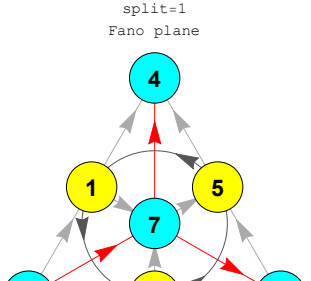
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	$-e_7$	e_6	$-e_2$	$-e_4$	e_3
e_2	$-e_5$	-1	$-e_6$	$-e_7$	e_1	e_3	e_4
e_3	e_7	e_6	-1	$-e_5$	e_4	$-e_2$	$-e_1$
e_4	$-e_6$	e_7	e_5	-1	$-e_3$	e_1	$-e_2$
e_5	e_2	$-e_1$	$-e_4$	e_3	-1	e_7	$-e_6$
e_6	e_4	$-e_3$	e_2	$-e_1$	$-e_7$	-1	e_5
e_7	$-e_3$	$-e_4$	e_1	e_2	e_6	$-e_5$	-1

split=1

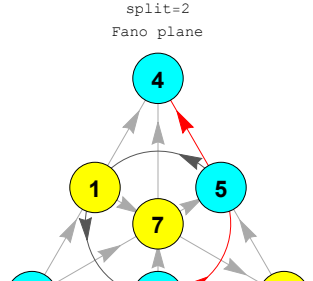
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	-7	6	-2	-4	3
2	-5	-1	-6	-7	1	3	4
3	7	6	1	5	4	2	1
4	-6	7	-5	1	-3	-1	2
5	2	-1	-4	3	-1	7	-6
6	4	-3	-2	1	-7	1	-5
7	-3	-4	-1	-2	6	5	1

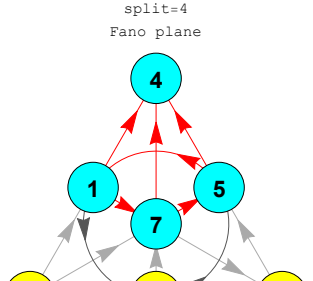
split=2

Fano plane



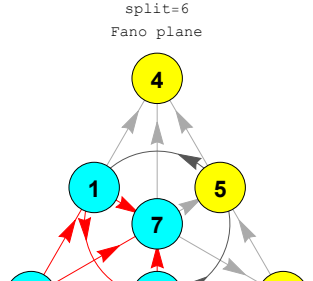
split=4

Fano plane



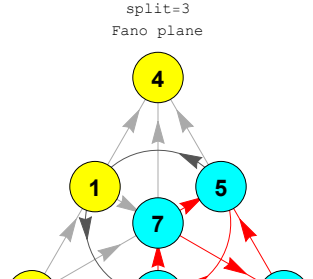
split=6

Fano plane



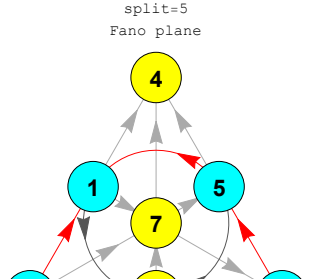
split=3

Fano plane



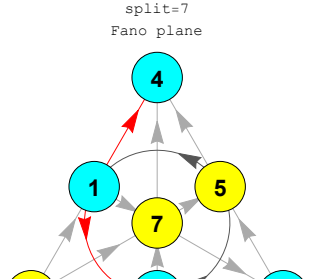
split=5

Fano plane



split=7

Fano plane

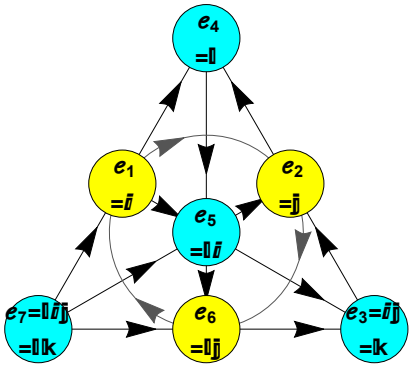


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
44	$s\ m_m^{-1/3}\ \check{R}$	■ ⬢	0apggsscc 000101111$_2$	Bn{ 1 0 1 1 0 0 0 0 } E8{ -1 0 0 0 0 0 0 -1 }	Bk 97

flip=False

{1, 2, 6}{1, 5, 3}{1, 4, 7}{2, 4, 3}{2, 7, 5}{3, 7, 6}{4, 5, 6}

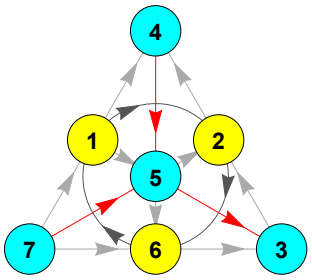
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_5$	e_7	e_3	$-e_2$	$-e_4$
e_2	$-e_6$	-1	$-e_4$	e_3	$-e_7$	e_1	e_5
e_3	e_5	e_4	-1	$-e_2$	$-e_1$	$-e_7$	e_6
e_4	$-e_7$	$-e_3$	e_2	-1	e_6	$-e_5$	e_1
e_5	$-e_3$	e_7	e_1	$-e_6$	-1	e_4	$-e_2$
e_6	e_2	$-e_1$	e_7	e_5	$-e_4$	-1	$-e_3$
e_7	e_4	$-e_5$	$-e_6$	$-e_1$	e_2	e_3	-1

split=1

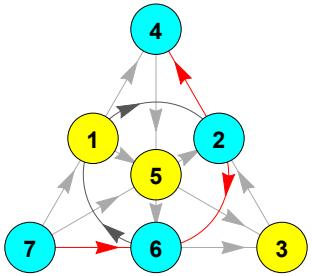
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	-5	7	3	-2	-4
2	-6	-1	-4	3	-7	1	5
3	5	4	1	2	1	-7	-6
4	-7	-3	-2	1	-6	-5	-1
5	-3	7	-1	6	1	4	2
6	2	-1	7	5	-4	-1	-3
7	4	-5	6	1	-2	3	1

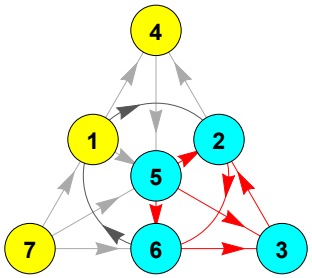
split=2

Fano plane



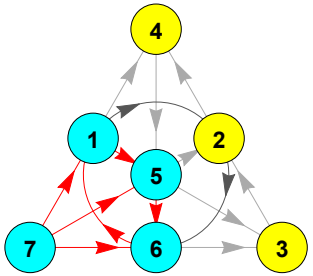
split=3

Fano plane



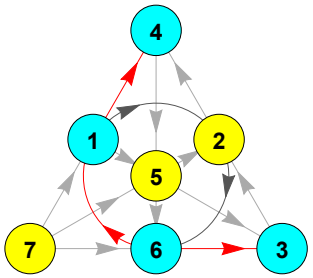
split=4

Fano plane



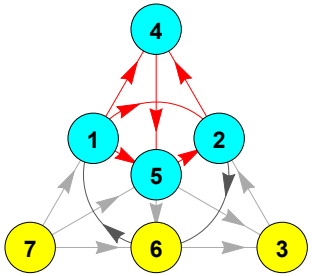
split=5

Fano plane



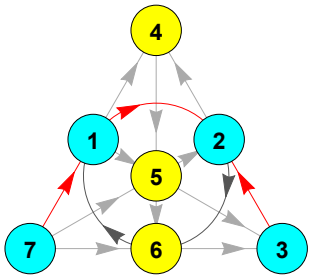
split=6

Fano plane



split=7

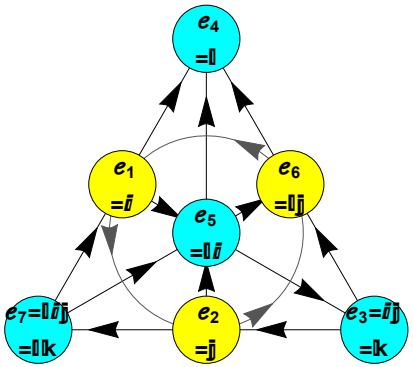
Fano plane



flip=True

{1, 2, 6}{1, 5, 3}{1, 4, 7}{2, 7, 3}{2, 5, 4}{3, 6, 4}{5, 6, 7}

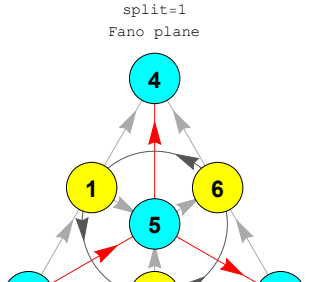
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_5$	e_7	e_3	$-e_2$	$-e_4$
e_2	$-e_6$	-1	$-e_7$	$-e_5$	e_4	e_1	e_3
e_3	e_5	e_7	-1	$-e_6$	$-e_1$	e_4	$-e_2$
e_4	$-e_7$	e_5	e_6	-1	$-e_2$	$-e_3$	e_1
e_5	$-e_3$	$-e_4$	e_1	e_2	-1	e_7	$-e_6$
e_6	e_2	$-e_1$	$-e_4$	e_3	$-e_7$	-1	e_5
e_7	e_4	$-e_3$	e_2	$-e_1$	e_6	$-e_5$	-1

split=1

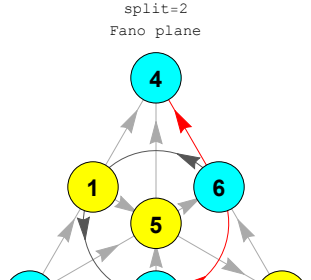
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	-5	7	3	-2	-4
2	-6	-1	-7	-5	4	1	3
3	5	7	1	6	1	4	2
4	-7	5	-6	1	2	-3	-1
5	-3	-4	-1	-2	1	7	6
6	2	-1	-4	3	-7	-1	5
7	4	-3	-2	1	-6	-5	1

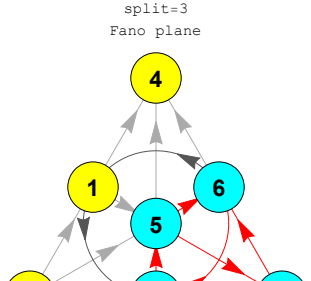
split=2

Fano plane



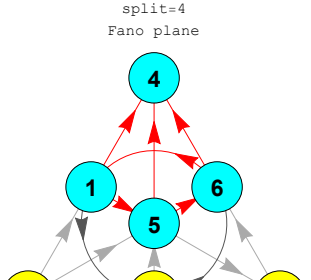
split=3

Fano plane



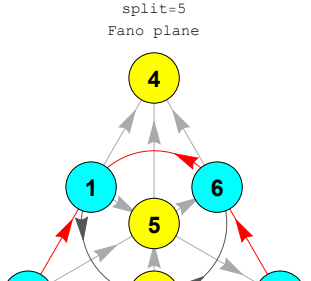
split=4

Fano plane



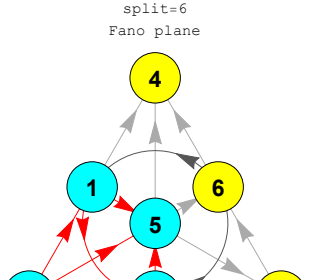
split=5

Fano plane



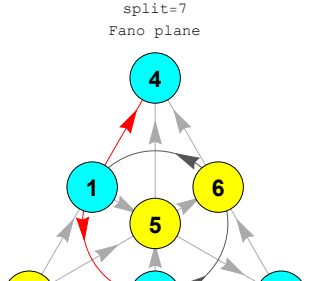
split=6

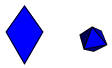
Fano plane



split=7

Fano plane

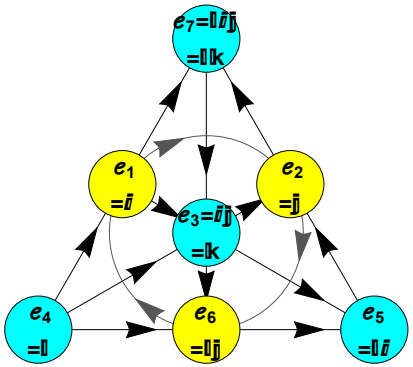


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
45	$\overline{\underset{bm}{C}}^{-2/3\to 1/3}_{L}$		0apggsscc 011101011_2	Bn{ 1 0 1 0 1 0 0 0 } E8{ -1 0 0 0 0 0 0 1 }	$\overline{\text{Ubn}}$ 120

flip=False

{1, 2, 6}{1, 3, 5}{1, 7, 4}{2, 4, 3}{2, 7, 5}{3, 6, 7}{4, 6, 5}

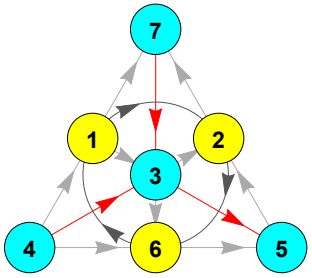
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	e_5	$-e_7$	$-e_3$	$-e_2$	e_4
e_2	$-e_6$	-1	$-e_4$	e_3	$-e_7$	e_1	e_5
e_3	$-e_5$	e_4	-1	$-e_2$	e_1	e_7	$-e_6$
e_4	e_7	$-e_3$	e_2	-1	$-e_6$	e_5	$-e_1$
e_5	e_3	e_7	$-e_1$	e_6	-1	$-e_4$	$-e_2$
e_6	e_2	$-e_1$	$-e_7$	$-e_5$	e_4	-1	e_3
e_7	$-e_4$	$-e_5$	e_6	e_1	e_2	$-e_3$	-1

split=1

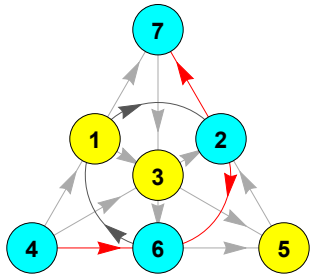
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	5	-7	-3	-2	4
2	-6	-1	-4	3	-7	1	5
3	-5	4	1	2	-1	7	6
4	7	-3	-2	1	6	5	1
5	3	7	1	-6	1	-4	2
6	2	-1	-7	-5	4	-1	3
7	-4	-5	-6	-1	-2	-3	1

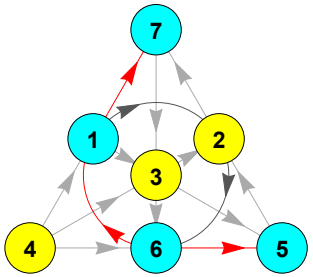
split=2

Fano plane



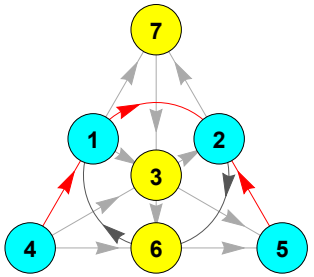
split=4

Fano plane



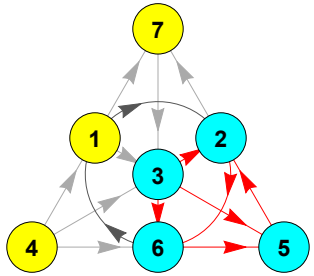
split=6

Fano plane



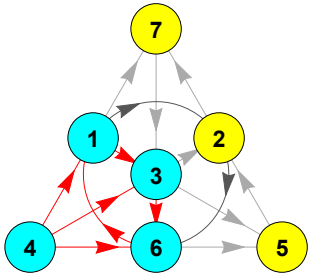
split=3

Fano plane



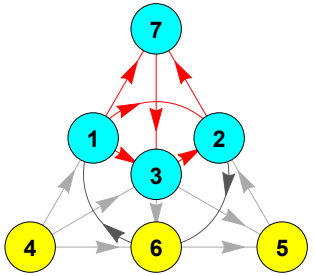
split=5

Fano plane



split=7

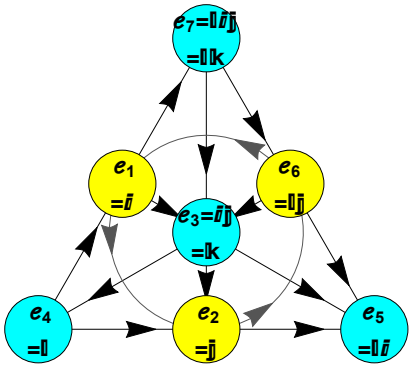
Fano plane



flip=True

{1, 2, 6}{1, 3, 5}{1, 7, 4}{2, 7, 3}{2, 5, 4}{3, 4, 6}{5, 7, 6}

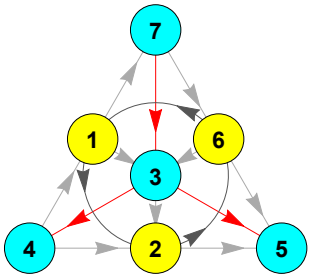
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	e_5	$-e_7$	$-e_3$	$-e_2$	e_4
e_2	$-e_6$	-1	$-e_7$	$-e_5$	e_4	e_1	e_3
e_3	$-e_5$	e_7	-1	e_6	e_1	$-e_4$	$-e_2$
e_4	e_7	e_5	$-e_6$	-1	$-e_2$	e_3	$-e_1$
e_5	e_3	$-e_4$	$-e_1$	e_2	-1	$-e_7$	e_6
e_6	e_2	$-e_1$	e_4	$-e_3$	e_7	-1	$-e_5$
e_7	$-e_4$	$-e_3$	e_2	e_1	$-e_6$	e_5	-1

split=1

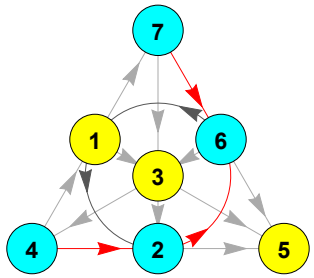
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	5	-7	-3	-2	4
2	-6	-1	-7	-5	4	1	3
3	-5	7	1	-6	-1	-4	2
4	7	5	6	1	2	3	1
5	3	-4	1	-2	1	-7	-6
6	2	-1	4	-3	7	-1	-5
7	-4	-3	-2	-1	6	5	1

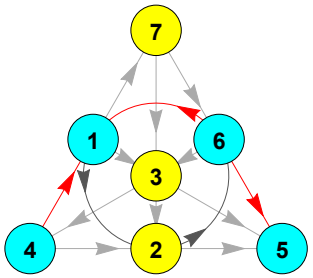
split=2

Fano plane



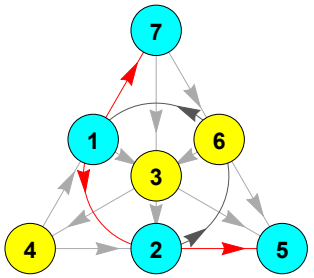
split=4

Fano plane



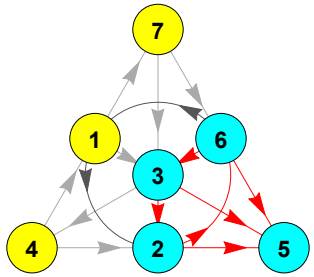
split=6

Fano plane



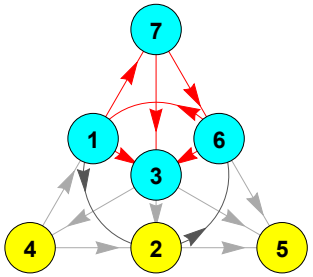
split=3

Fano plane



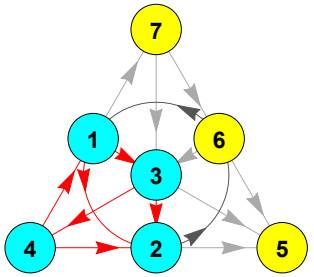
split=5

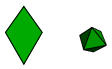
Fano plane



split=7

Fano plane

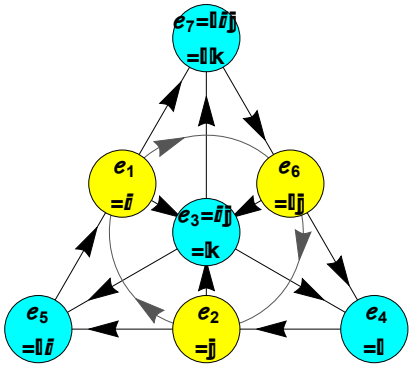


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
46	$\overline{\underset{g_m}{C}}^{0\to 1/3}_{L}$		0apggsscc 011101010_2	Bn{ E8{	1 -1	0 0	1 0	0 0	0 0	1 0	0 1	0 0	} }	$\overline{Mo}$ 42

flip=False

{1, 6, 2}{1, 3, 4}{1, 7, 5}{2, 3, 7}{2, 5, 4}{3, 5, 6}{4, 7, 6}

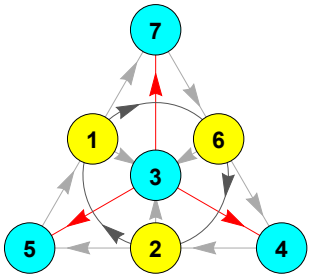
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_6$	e_4	$-e_3$	$-e_7$	e_2	e_5
e_2	e_6	-1	e_7	$-e_5$	e_4	$-e_1$	$-e_3$
e_3	$-e_4$	$-e_7$	-1	e_1	e_6	$-e_5$	e_2
e_4	e_3	e_5	$-e_1$	-1	$-e_2$	$-e_7$	e_6
e_5	e_7	$-e_4$	$-e_6$	e_2	-1	e_3	$-e_1$
e_6	$-e_2$	e_1	e_5	e_7	$-e_3$	-1	$-e_4$
e_7	$-e_5$	e_3	$-e_2$	$-e_6$	e_1	e_4	-1

split=1

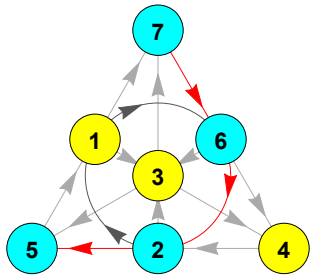
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	4	-3	-7	2	5
2	6	-1	7	-5	4	-1	-3
3	-4	-7	1	-1	-6	-5	-2
4	3	5	1	1	2	-7	-6
5	7	-4	6	-2	1	3	1
6	-2	1	5	7	-3	-1	-4
7	-5	3	2	6	-1	4	1

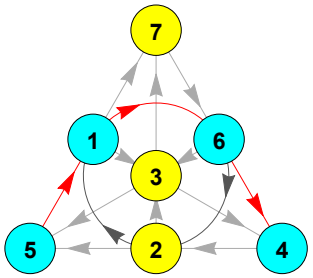
split=2

Fano plane



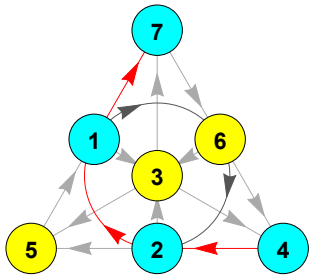
split=4

Fano plane



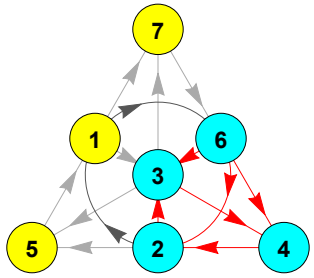
split=6

Fano plane



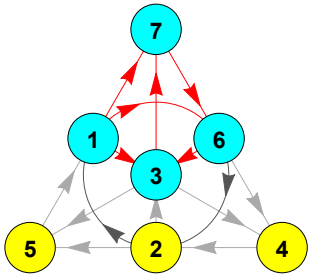
split=3

Fano plane



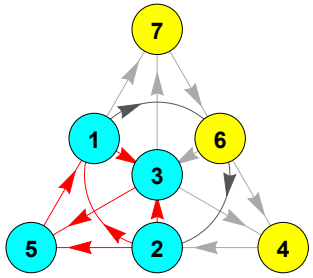
split=5

Fano plane



split=7

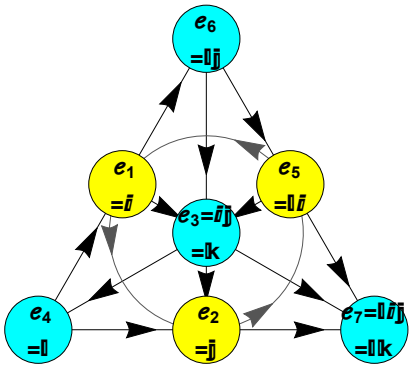
Fano plane



flip=True

{1, 2, 5}{1, 3, 7}{1, 6, 4}{2, 6, 3}{2, 7, 4}{3, 4, 5}{5, 7, 6}

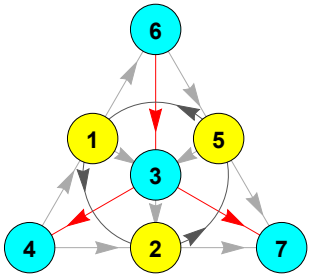
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	e_7	$-e_6$	$-e_2$	e_4	$-e_3$
e_2	$-e_5$	-1	$-e_6$	$-e_7$	e_1	e_3	e_4
e_3	$-e_7$	e_6	-1	e_5	$-e_4$	$-e_2$	e_1
e_4	e_6	e_7	$-e_5$	-1	e_3	$-e_1$	$-e_2$
e_5	e_2	$-e_1$	e_4	$-e_3$	-1	$-e_7$	e_6
e_6	$-e_4$	$-e_3$	e_2	e_1	e_7	-1	$-e_5$
e_7	e_3	$-e_4$	$-e_1$	e_2	$-e_6$	e_5	-1

split=1

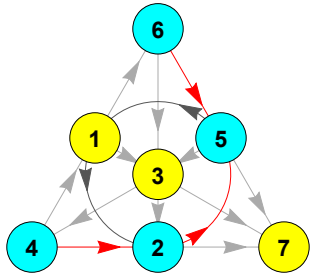
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	7	-6	-2	4	-3
2	-5	-1	-6	-7	1	3	4
3	-7	6	1	-5	-4	2	-1
4	6	7	5	1	3	1	2
5	2	-1	4	-3	-1	-7	6
6	-4	-3	-2	-1	7	1	5
7	3	-4	1	-2	-6	-5	1

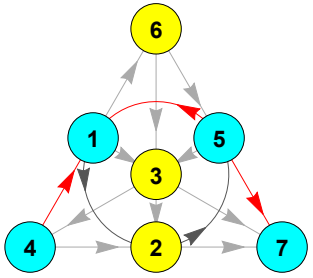
split=2

Fano plane



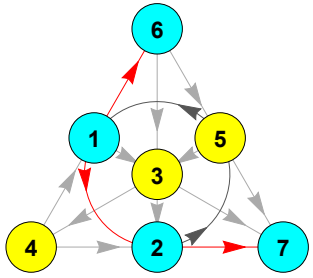
split=4

Fano plane



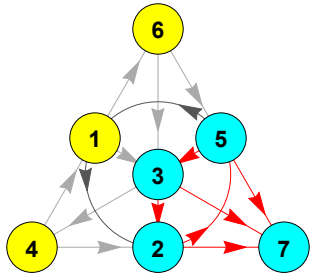
split=6

Fano plane



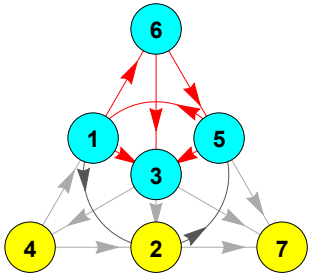
split=3

Fano plane



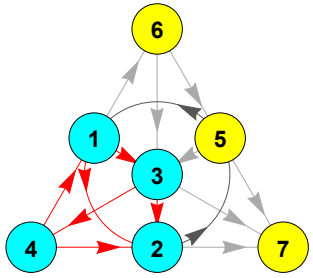
split=5

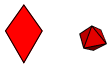
Fano plane



split=7

Fano plane

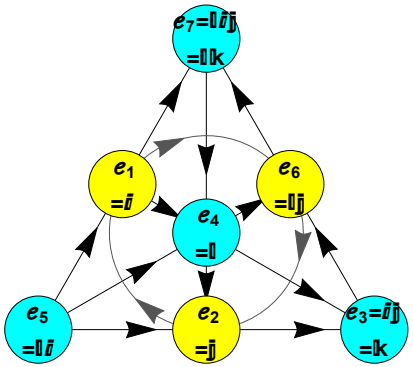


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
47	$\overline{\underset{rm}{C}}^{0\to 1/3}_{L}$		0apggsscc 011101001_2	Bn{ 1 0 1 0 0 0 1 0 } E8{ -1 0 0 0 0 1 0 0 }								$\overline{Kr}$ 36

flip=False

{1, 6, 2}{1, 4, 3}{1, 7, 5}{2, 3, 5}{2, 7, 4}{3, 6, 7}{4, 6, 5}

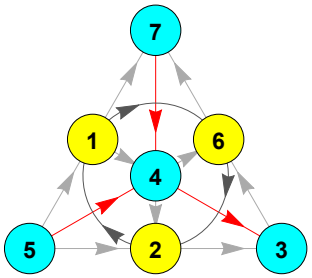
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_6$	$-e_4$	e_3	$-e_7$	e_2	e_5
e_2	e_6	-1	e_5	$-e_7$	$-e_3$	$-e_1$	e_4
e_3	e_4	$-e_5$	-1	$-e_1$	e_2	e_7	$-e_6$
e_4	$-e_3$	e_7	e_1	-1	$-e_6$	e_5	$-e_2$
e_5	e_7	e_3	$-e_2$	e_6	-1	$-e_4$	$-e_1$
e_6	$-e_2$	e_1	$-e_7$	$-e_5$	e_4	-1	e_3
e_7	$-e_5$	$-e_4$	e_6	e_2	e_1	$-e_3$	-1

split=1

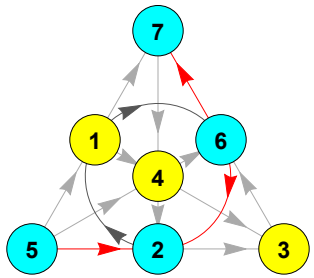
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	-4	3	-7	2	5
2	6	-1	5	-7	-3	-1	4
3	4	-5	1	1	-2	7	6
4	-3	7	-1	1	6	5	2
5	7	3	2	-6	1	-4	1
6	-2	1	-7	-5	4	-1	3
7	-5	-4	-6	-2	-1	-3	1

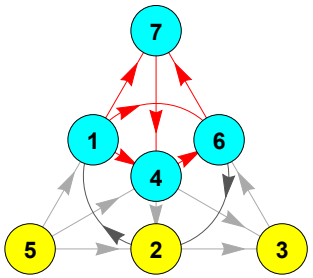
split=2

Fano plane



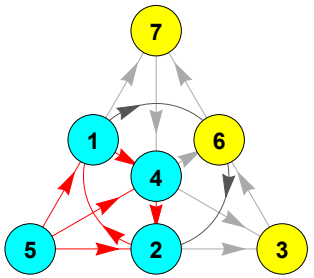
split=4

Fano plane



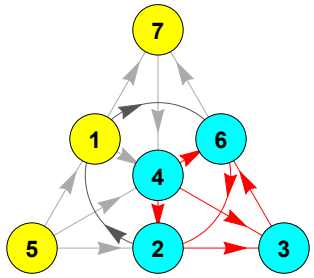
split=6

Fano plane



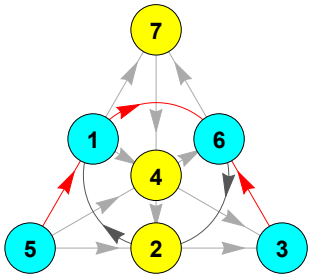
split=3

Fano plane



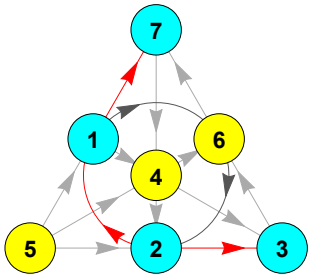
split=5

Fano plane



split=7

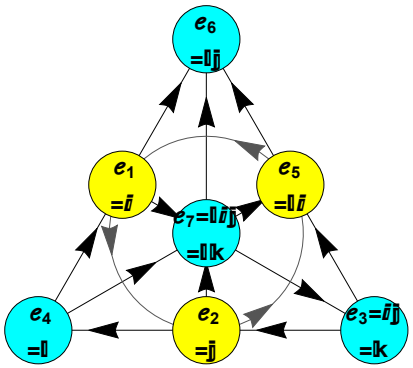
Fano plane



flip=True

{1, 2, 5}{1, 7, 3}{1, 6, 4}{2, 4, 3}{2, 7, 6}{3, 5, 6}{4, 7, 5}

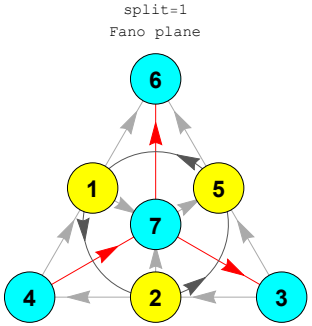
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	$-e_7$	$-e_6$	$-e_2$	e_4	e_3
e_2	$-e_5$	-1	$-e_4$	e_3	e_1	$-e_7$	e_6
e_3	e_7	e_4	-1	$-e_2$	e_6	$-e_5$	$-e_1$
e_4	e_6	$-e_3$	e_2	-1	$-e_7$	$-e_1$	e_5
e_5	e_2	$-e_1$	$-e_6$	e_7	-1	e_3	$-e_4$
e_6	$-e_4$	e_7	e_5	e_1	$-e_3$	-1	$-e_2$
e_7	$-e_3$	$-e_6$	e_1	$-e_5$	e_4	e_2	-1

split=1

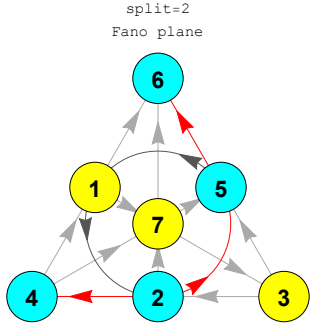
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	-7	-6	-2	4	3
2	-5	-1	-4	3	1	-7	6
3	7	4	1	2	6	5	1
4	6	-3	-2	1	-7	1	-5
5	2	-1	-6	7	-1	3	-4
6	-4	7	-5	-1	-3	1	2
7	-3	-6	-1	5	4	-2	1

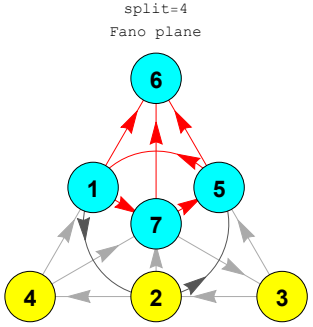
split=2

Fano plane



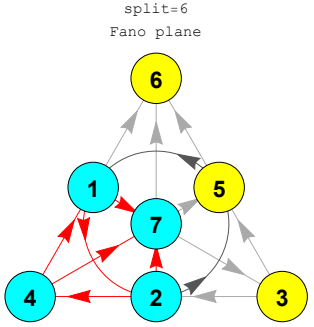
split=4

Fano plane



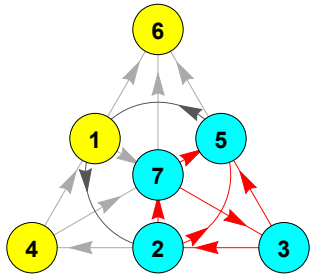
split=6

Fano plane



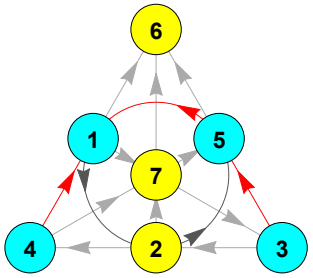
split=3

Fano plane



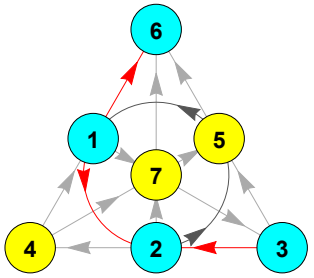
split=5

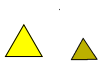
Fano plane



split=7

Fano plane

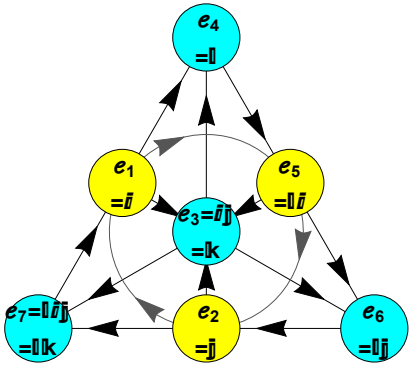


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
48	$\mu_{\gamma_m}^{\vec{R}\to 0}$		0apggsscc 000101100$_2$	Bn{ 1 0 1 0 0 0 0 1 } E8{ -1 0 0 0 1 0 0 0 }	$\overline{Cu}$ 29

flip=False

{1, 5, 2}{1, 3, 6}{1, 4, 7}{2, 3, 4}{2, 7, 6}{3, 7, 5}{4, 5, 6}

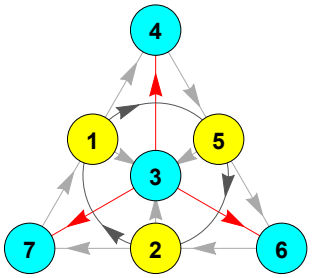
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_5$	e_6	e_7	e_2	$-e_3$	$-e_4$
e_2	e_5	-1	e_4	$-e_3$	$-e_1$	$-e_7$	e_6
e_3	$-e_6$	$-e_4$	-1	e_2	$-e_7$	e_1	e_5
e_4	$-e_7$	e_3	$-e_2$	-1	e_6	$-e_5$	e_1
e_5	$-e_2$	e_1	e_7	$-e_6$	-1	e_4	$-e_3$
e_6	e_3	e_7	$-e_1$	e_5	$-e_4$	-1	$-e_2$
e_7	e_4	$-e_6$	$-e_5$	$-e_1$	e_3	e_2	-1

split=1

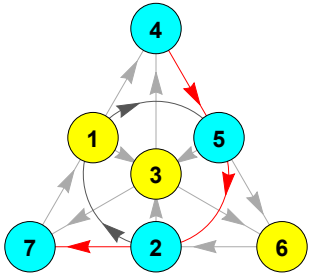
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-5	6	7	2	-3	-4
2	5	-1	4	-3	-1	-7	6
3	-6	-4	1	-2	-7	-1	-5
4	-7	3	2	1	6	5	-1
5	-2	1	7	-6	-1	4	-3
6	3	7	1	-5	-4	1	2
7	4	-6	5	1	3	-2	1

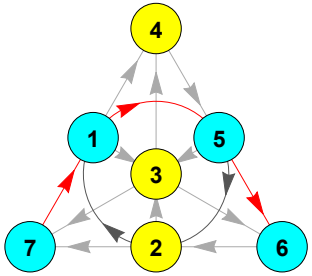
split=2

Fano plane



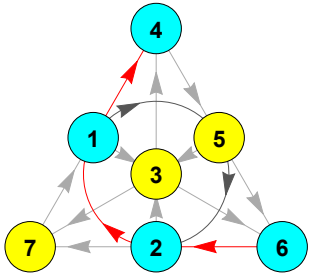
split=4

Fano plane



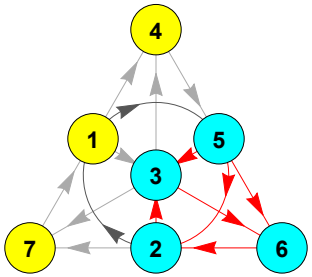
split=6

Fano plane



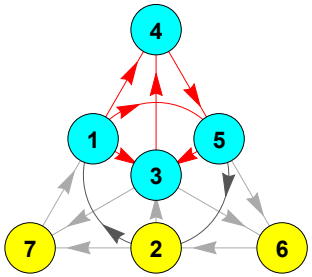
split=3

Fano plane



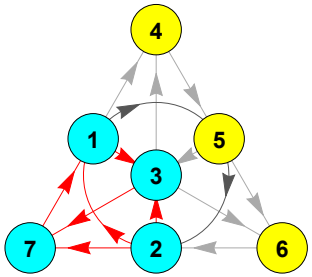
split=5

Fano plane



split=7

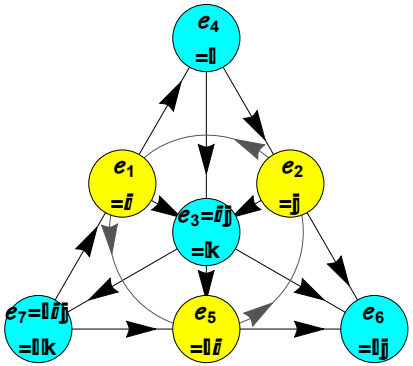
Fano plane



flip=True

{1, 5, 2}{1, 3, 6}{1, 4, 7}{2, 3, 7}{2, 6, 4}{3, 5, 4}{5, 6, 7}

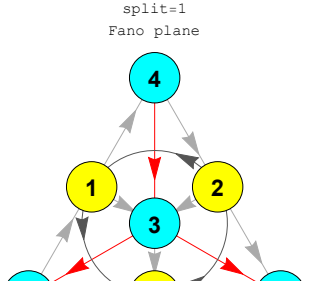
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_5$	e_6	e_7	e_2	$-e_3$	$-e_4$
e_2	e_5	-1	e_7	$-e_6$	$-e_1$	e_4	$-e_3$
e_3	$-e_6$	$-e_7$	-1	$-e_5$	e_4	e_1	e_2
e_4	$-e_7$	e_6	e_5	-1	$-e_3$	$-e_2$	e_1
e_5	$-e_2$	e_1	$-e_4$	e_3	-1	e_7	$-e_6$
e_6	e_3	$-e_4$	$-e_1$	e_2	$-e_7$	-1	e_5
e_7	e_4	e_3	$-e_2$	$-e_1$	e_6	$-e_5$	-1

split=1

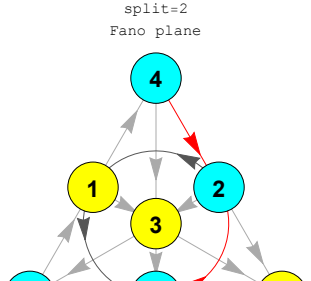
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-5	6	7	2	-3	-4
2	5	-1	7	-6	-1	4	-3
3	-6	-7	1	5	4	-1	-2
4	-7	6	-5	1	-3	2	-1
5	-2	1	-4	3	-1	7	-6
6	3	-4	1	-2	-7	1	-5
7	4	3	2	1	6	5	1

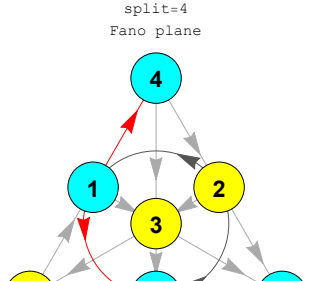
split=2

Fano plane



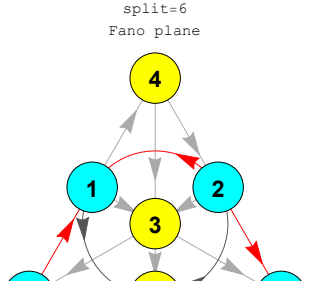
split=4

Fano plane



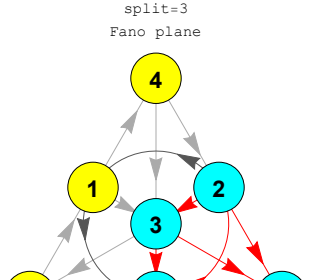
split=6

Fano plane



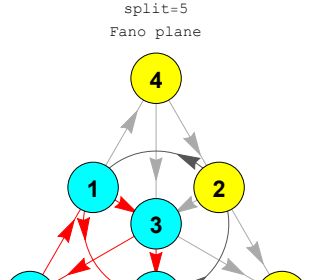
split=3

Fano plane



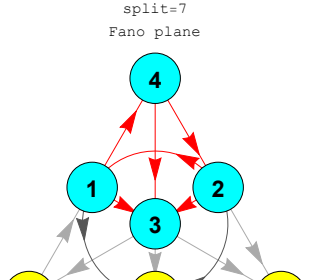
split=5

Fano plane



split=7

Fano plane

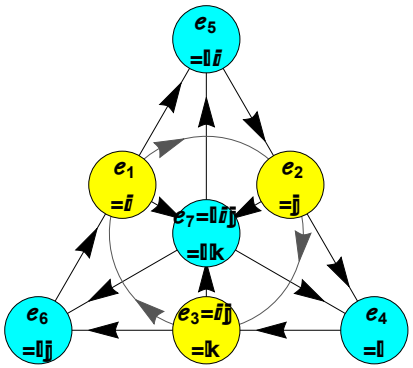


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates								Ele #
49	$\overline{e_{\tau\Phi}}$		0apggsscc	Bn{	1	0	0	1	1	0	0	0	$\overline{Ti}$
	$_{g_d}$ $^{0\to-1}_{\tau}$		011000010_2	E8{	-1	0	0	1	0	0	0	0	22

flip=False

{1, 2, 3}{1, 7, 4}{1, 5, 6}{2, 4, 5}{2, 7, 6}{3, 6, 4}{3, 7, 5}

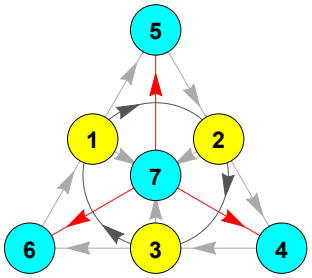
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	$-e_7$	e_6	$-e_5$	e_4
e_2	$-e_3$	-1	e_1	e_5	$-e_4$	$-e_7$	e_6
e_3	e_2	$-e_1$	-1	$-e_6$	$-e_7$	e_4	e_5
e_4	e_7	$-e_5$	e_6	-1	e_2	$-e_3$	$-e_1$
e_5	$-e_6$	e_4	e_7	$-e_2$	-1	e_1	$-e_3$
e_6	e_5	e_7	$-e_4$	e_3	$-e_1$	-1	$-e_2$
e_7	$-e_4$	$-e_6$	$-e_5$	e_1	e_3	e_2	-1

split=1

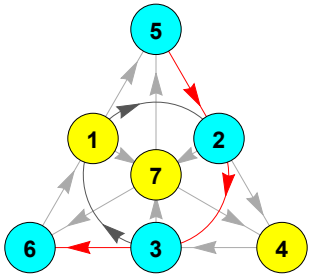
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	-7	6	-5	4
2	-3	-1	1	5	-4	-7	6
3	2	-1	-1	-6	-7	4	5
4	7	-5	6	1	-2	3	1
5	-6	4	7	2	1	-1	3
6	5	7	-4	-3	1	1	2
7	-4	-6	-5	-1	-3	-2	1

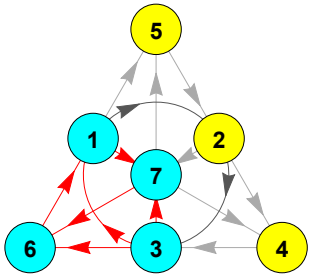
split=2

Fano plane



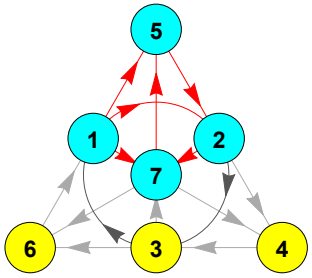
split=4

Fano plane



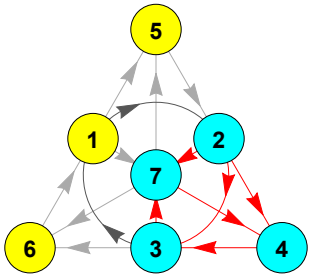
split=6

Fano plane



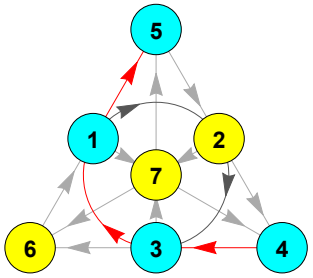
split=3

Fano plane



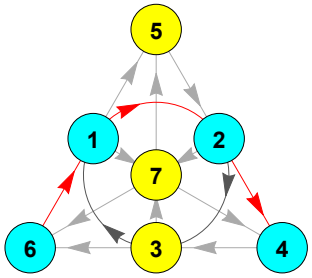
split=5

Fano plane



split=7

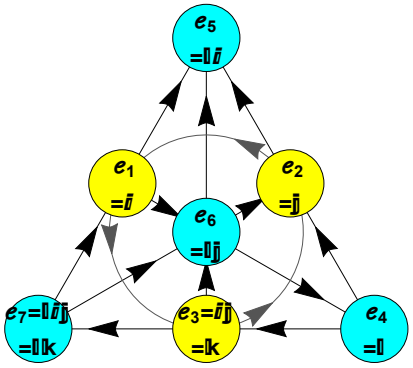
Fano plane



flip=True

{1, 3, 2}{1, 6, 4}{1, 5, 7}{2, 5, 4}{2, 7, 6}{3, 7, 4}{3, 6, 5}

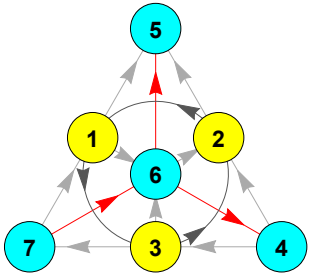
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_6$	e_7	e_4	$-e_5$
e_2	e_3	-1	$-e_1$	$-e_5$	e_4	$-e_7$	e_6
e_3	$-e_2$	e_1	-1	$-e_7$	$-e_6$	e_5	e_4
e_4	e_6	e_5	e_7	-1	$-e_2$	$-e_1$	$-e_3$
e_5	$-e_7$	$-e_4$	e_6	e_2	-1	$-e_3$	e_1
e_6	$-e_4$	e_7	$-e_5$	e_1	e_3	-1	$-e_2$
e_7	e_5	$-e_6$	$-e_4$	e_3	$-e_1$	e_2	-1

split=1

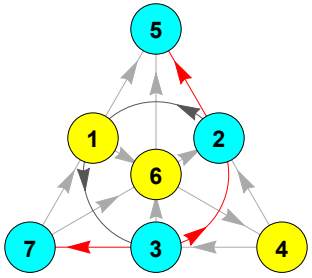
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-6	7	4	-5
2	3	-1	-1	-5	4	-7	6
3	-2	1	-1	-7	-6	5	4
4	6	5	7	1	2	1	3
5	-7	-4	6	-2	1	3	-1
6	-4	7	-5	-1	-3	1	2
7	5	-6	-4	-3	1	-2	1

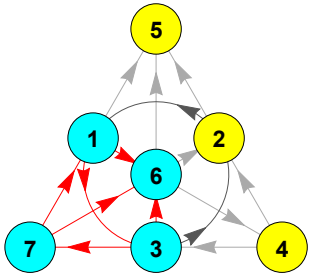
split=2

Fano plane



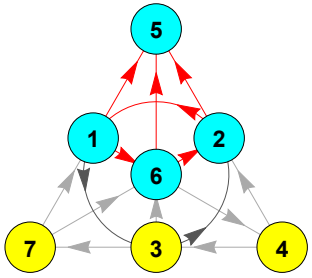
split=4

Fano plane



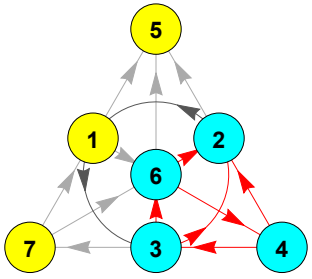
split=6

Fano plane



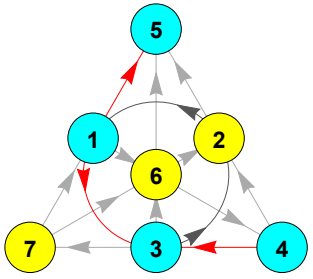
split=3

Fano plane



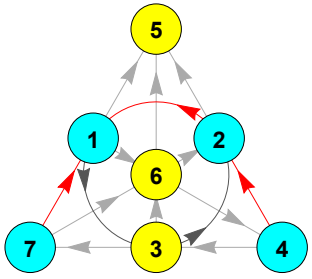
split=5

Fano plane



split=7

Fano plane

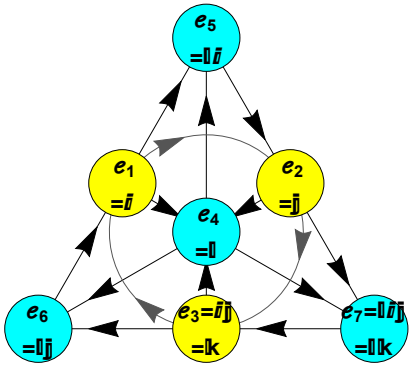


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
50	$e_7 \phi^{0}_{b_1 \bar{R}}$		0apggsscc 001000111_2	Bn{ E8{	1 -1	0 0	0 1	1 0	0 0	1 0	0 0	0 0	} }	$\bar{P}$ 15

flip=False

{1, 2, 3}{1, 4, 7}{1, 5, 6}{2, 4, 6}{2, 7, 5}{3, 4, 5}{3, 6, 7}

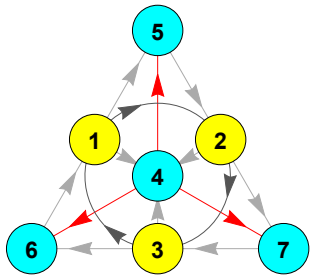
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_7	e_6	$-e_5$	$-e_4$
e_2	$-e_3$	-1	e_1	e_6	$-e_7$	$-e_4$	e_5
e_3	e_2	$-e_1$	-1	e_5	$-e_4$	e_7	$-e_6$
e_4	$-e_7$	$-e_6$	$-e_5$	-1	e_3	e_2	e_1
e_5	$-e_6$	e_7	e_4	$-e_3$	-1	e_1	$-e_2$
e_6	e_5	e_4	$-e_7$	$-e_2$	$-e_1$	-1	e_3
e_7	e_4	$-e_5$	e_6	$-e_1$	e_2	$-e_3$	-1

split=1

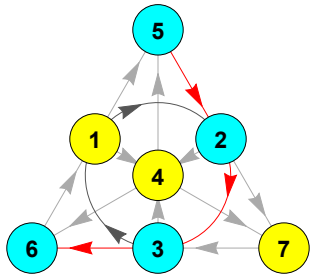
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	7	6	-5	-4
2	-3	-1	1	6	-7	-4	5
3	2	-1	-1	5	-4	7	-6
4	-7	-6	-5	1	-3	-2	-1
5	-6	7	4	3	1	-1	2
6	5	4	-7	2	1	1	-3
7	4	-5	6	1	-2	3	1

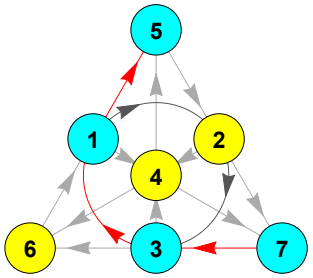
split=2

Fano plane



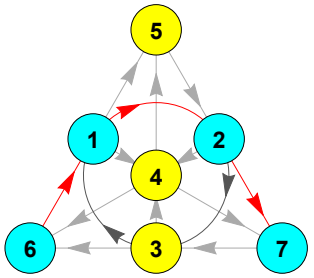
split=4

Fano plane



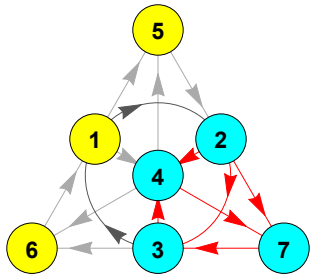
split=6

Fano plane



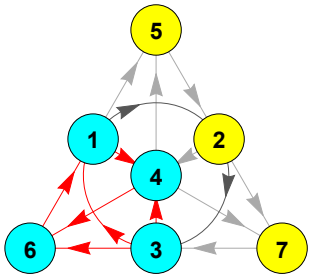
split=3

Fano plane



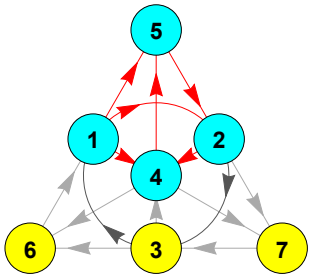
split=5

Fano plane



split=7

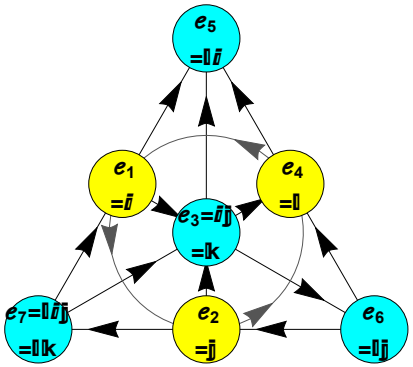
Fano plane



flip=True

{1, 2, 4}{1, 3, 6}{1, 5, 7}{2, 3, 5}{2, 7, 6}{3, 4, 7}{4, 5, 6}

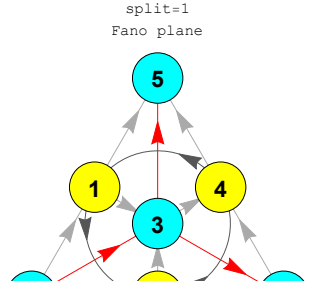
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_4	e_6	$-e_2$	e_7	$-e_3$	$-e_5$
e_2	$-e_4$	-1	e_5	e_1	$-e_3$	$-e_7$	e_6
e_3	$-e_6$	$-e_5$	-1	e_7	e_2	e_1	$-e_4$
e_4	e_2	$-e_1$	$-e_7$	-1	e_6	$-e_5$	e_3
e_5	$-e_7$	e_3	$-e_2$	$-e_6$	-1	e_4	e_1
e_6	e_3	e_7	$-e_1$	e_5	$-e_4$	-1	$-e_2$
e_7	e_5	$-e_6$	e_4	$-e_3$	$-e_1$	e_2	-1

split=1

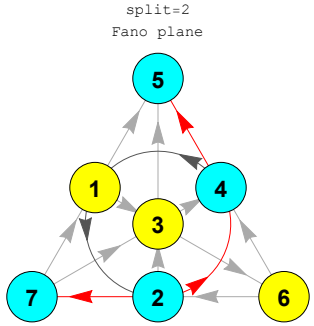
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	4	6	-2	7	-3	-5
2	-4	-1	5	1	-3	-7	6
3	-6	-5	1	7	-2	-1	4
4	2	-1	-7	-1	6	-5	3
5	-7	3	2	-6	1	-4	-1
6	3	7	1	5	4	1	2
7	5	-6	-4	-3	1	-2	1

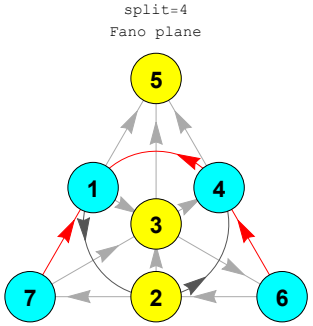
split=2

Fano plane



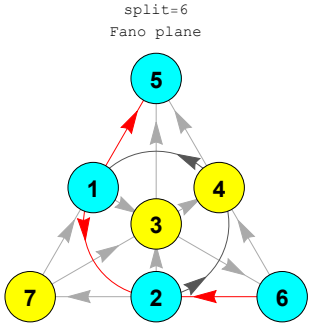
split=4

Fano plane



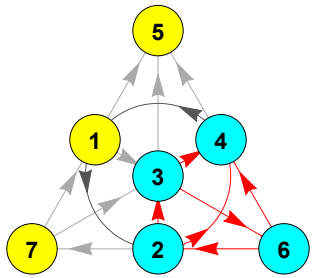
split=6

Fano plane



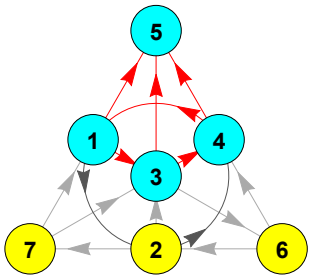
split=3

Fano plane



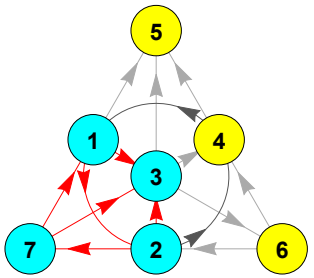
split=5

Fano plane



split=7

Fano plane

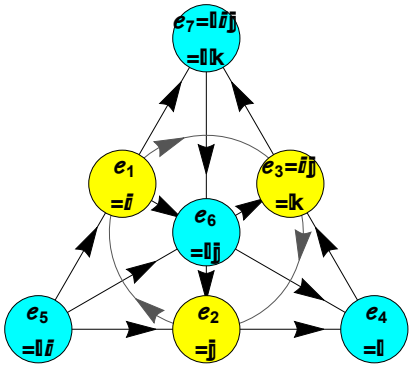


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
51	ω_{R}^{0} $_{gm}$ $_{R}$		0apggsscc	Bn{	1	0	0	1	0	0	1	0	}	$\overline{O}$
			001001110_2	E8{	-1	1	0	0	0	0	0	0	}	8

flip=False

{1, 3, 2}{1, 6, 4}{1, 7, 5}{2, 4, 5}{2, 7, 6}{3, 7, 4}{3, 5, 6}

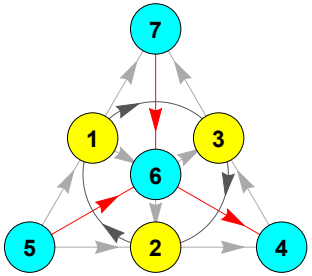
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_6$	$-e_7$	e_4	e_5
e_2	e_3	-1	$-e_1$	e_5	$-e_4$	$-e_7$	e_6
e_3	$-e_2$	e_1	-1	$-e_7$	e_6	$-e_5$	e_4
e_4	e_6	$-e_5$	e_7	-1	e_2	$-e_1$	$-e_3$
e_5	e_7	e_4	$-e_6$	$-e_2$	-1	e_3	$-e_1$
e_6	$-e_4$	e_7	e_5	e_1	$-e_3$	-1	$-e_2$
e_7	$-e_5$	$-e_6$	$-e_4$	e_3	e_1	e_2	-1

split=1

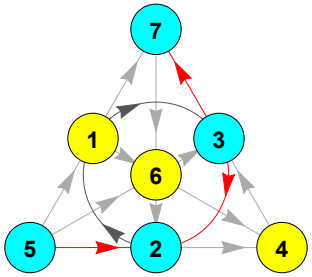
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-6	-7	4	5
2	3	-1	-1	5	-4	-7	6
3	-2	1	-1	-7	6	-5	4
4	6	-5	7	1	-2	1	3
5	7	4	-6	2	1	-3	1
6	-4	7	5	-1	3	1	2
7	-5	-6	-4	-3	-1	-2	1

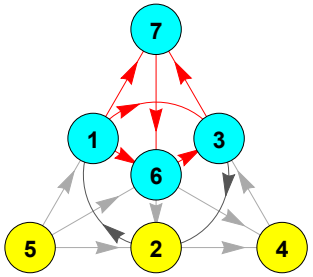
split=2

Fano plane



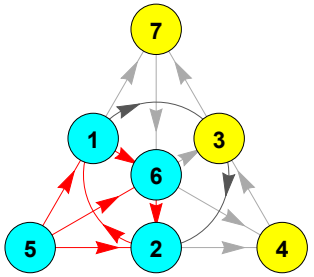
split=4

Fano plane



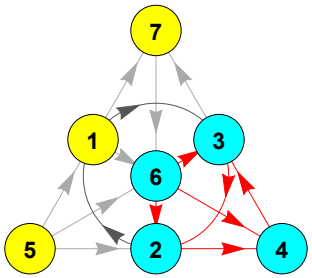
split=6

Fano plane



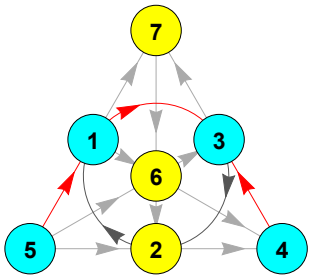
split=3

Fano plane



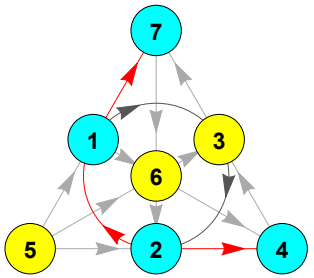
split=5

Fano plane



split=7

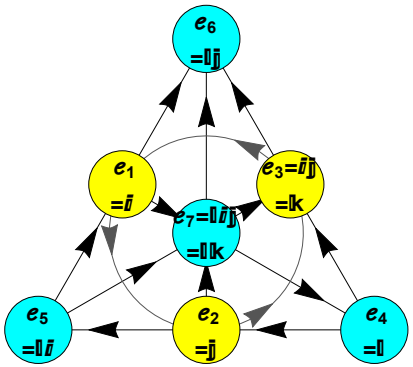
Fano plane



flip=True

{1, 2, 3}{1, 7, 4}{1, 6, 5}{2, 5, 4}{2, 7, 6}{3, 6, 4}{3, 5, 7}

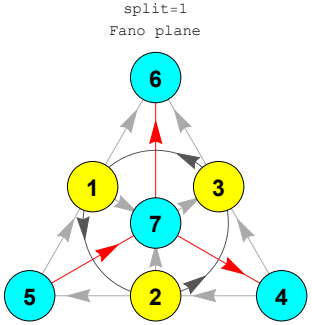
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	$-e_7$	$-e_6$	e_5	e_4
e_2	$-e_3$	-1	e_1	$-e_5$	e_4	$-e_7$	e_6
e_3	e_2	$-e_1$	-1	$-e_6$	e_7	e_4	$-e_5$
e_4	e_7	e_5	e_6	-1	$-e_2$	$-e_3$	$-e_1$
e_5	e_6	$-e_4$	$-e_7$	e_2	-1	e_1	e_3
e_6	$-e_5$	e_7	$-e_4$	e_3	e_1	-1	$-e_2$
e_7	$-e_4$	$-e_6$	e_5	e_1	$-e_3$	e_2	-1

split=1

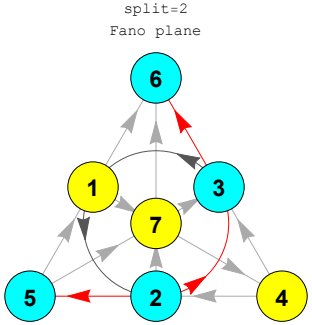
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	-7	-6	5	4
2	-3	-1	1	-5	4	-7	6
3	2	-1	-1	-6	7	4	-5
4	7	5	6	1	2	3	1
5	6	-4	-7	-2	1	1	-3
6	-5	7	-4	-3	-1	1	2
7	-4	-6	5	-1	3	-2	1

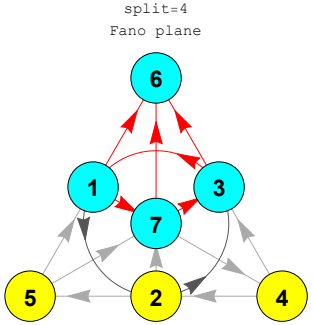
split=2

Fano plane



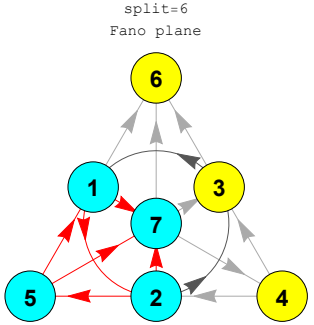
split=4

Fano plane



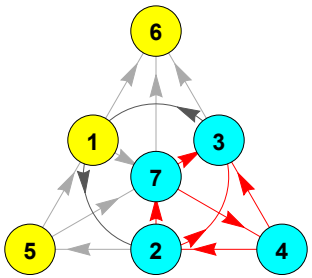
split=6

Fano plane



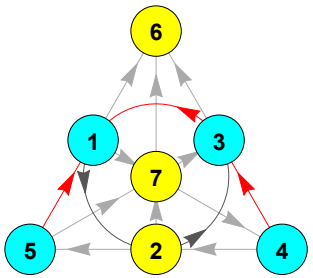
split=3

Fano plane



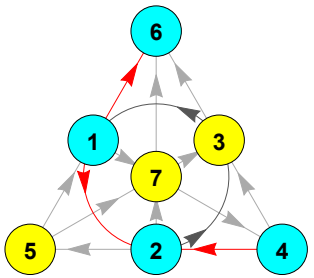
split=5

Fano plane



split=7

Fano plane

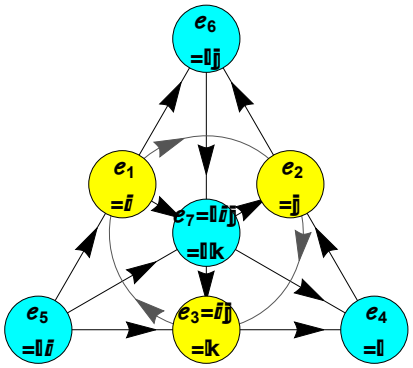


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates									Ele #
52	$e_S \phi^{0}_{b_d} t$		0apggsscc	001000011₂	Bn{	1	0	0	1	0	0	0	1	}	$\overline{Nd}$ 60
					E8{	0	−1	−1	0	0	0	0	0	}	

flip=False

{1, 2, 3}{1, 7, 4}{1, 6, 5}{2, 6, 4}{2, 5, 7}{3, 4, 5}{3, 6, 7}

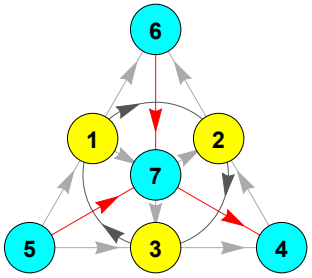
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	$-e_7$	$-e_6$	e_5	e_4
e_2	$-e_3$	−1	e_1	$-e_6$	e_7	e_4	$-e_5$
e_3	e_2	$-e_1$	−1	e_5	$-e_4$	e_7	$-e_6$
e_4	e_7	e_6	$-e_5$	−1	e_3	$-e_2$	$-e_1$
e_5	e_6	$-e_7$	e_4	$-e_3$	−1	$-e_1$	e_2
e_6	$-e_5$	$-e_4$	$-e_7$	e_2	e_1	−1	e_3
e_7	$-e_4$	e_5	e_6	e_1	$-e_2$	$-e_3$	−1

split=1

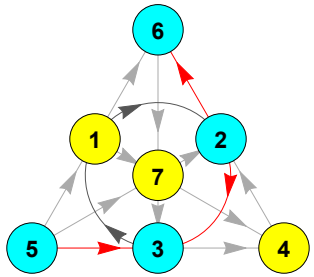
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−7	−6	5	4
2	−3	−1	1	−6	7	4	−5
3	2	−1	−1	5	−4	7	−6
4	7	6	−5	1	−3	2	1
5	6	−7	4	3	1	1	−2
6	−5	−4	−7	−2	−1	1	−3
7	−4	5	6	−1	2	3	1

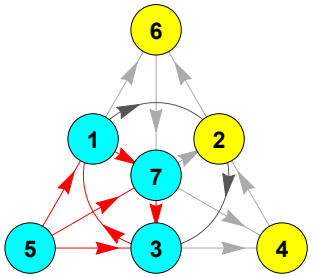
split=2

Fano plane



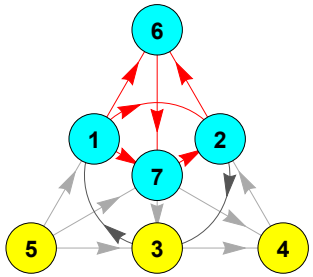
split=4

Fano plane



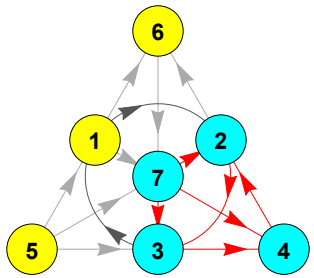
split=6

Fano plane



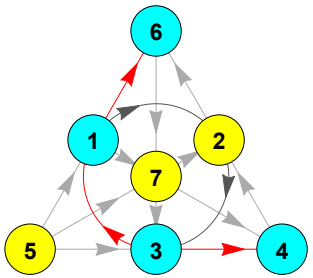
split=3

Fano plane



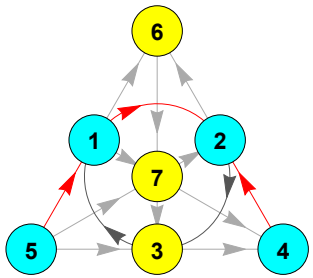
split=5

Fano plane



split=7

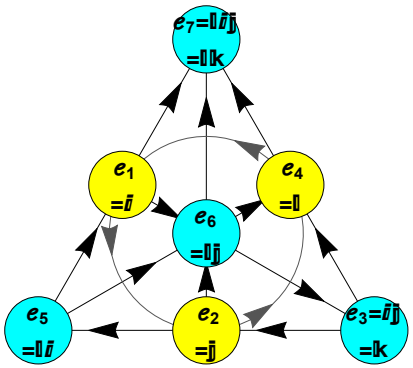
Fano plane



flip=True

{1, 2, 4}{1, 6, 3}{1, 7, 5}{2, 5, 3}{2, 6, 7}{3, 4, 7}{4, 5, 6}

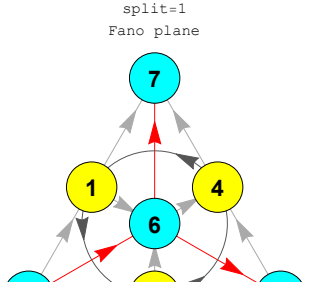
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_6$	$-e_2$	$-e_7$	e_3	e_5
e_2	$-e_4$	−1	$-e_5$	e_1	e_3	e_7	$-e_6$
e_3	e_6	e_5	−1	e_7	$-e_2$	$-e_1$	$-e_4$
e_4	e_2	$-e_1$	$-e_7$	−1	e_6	$-e_5$	e_3
e_5	e_7	$-e_3$	e_2	$-e_6$	−1	e_4	$-e_1$
e_6	$-e_3$	$-e_7$	e_1	e_5	$-e_4$	−1	e_2
e_7	$-e_5$	e_6	e_4	$-e_3$	e_1	$-e_2$	−1

split=1

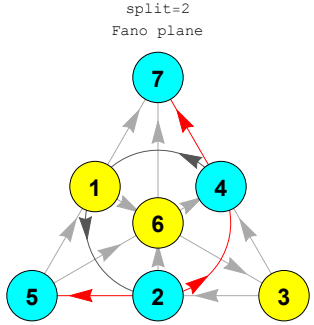
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−6	−2	−7	3	5
2	−4	−1	−5	1	3	7	−6
3	6	5	1	7	2	1	4
4	2	−1	−7	−1	6	−5	3
5	7	−3	−2	−6	1	−4	1
6	−3	−7	−1	5	4	1	−2
7	−5	6	−4	−3	−1	2	1

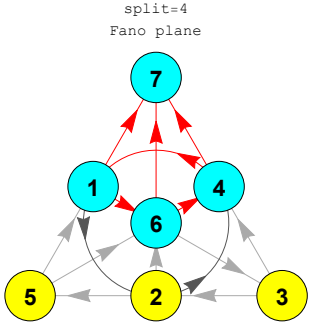
split=2

Fano plane



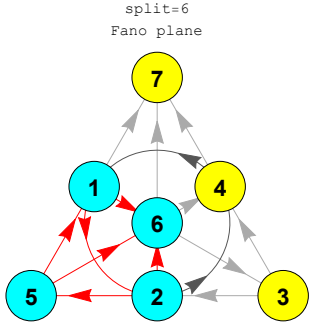
split=4

Fano plane



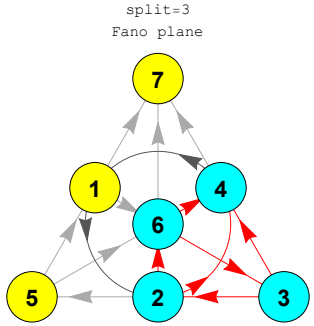
split=6

Fano plane



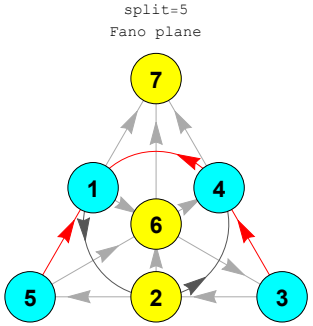
split=3

Fano plane



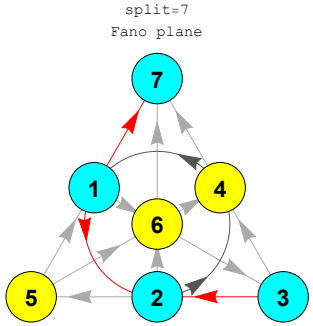
split=5

Fano plane



split=7

Fano plane

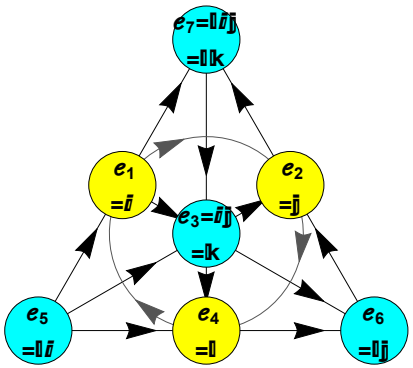


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates								Ele #
53	$\overline{\underset{\mathbb{b}_m}{B}}^{0\to1}$		0apggsscc	Bn{	1	0	0	0	1	1	0	0 }	$\overline{Xe}$
			011001011_2	E8{	0	−1	0	−1	0	0	0	0 }	54

flip=False

{1, 2, 4}{1, 3, 6}{1, 7, 5}{2, 5, 3}{2, 7, 6}{3, 4, 7}{4, 6, 5}

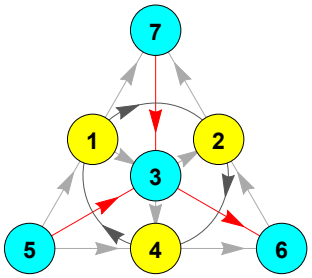
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_6	$-e_2$	$-e_7$	$-e_3$	e_5
e_2	$-e_4$	−1	$-e_5$	e_1	e_3	$-e_7$	e_6
e_3	$-e_6$	e_5	−1	e_7	$-e_2$	e_1	$-e_4$
e_4	e_2	$-e_1$	$-e_7$	−1	$-e_6$	e_5	e_3
e_5	e_7	$-e_3$	e_2	e_6	−1	$-e_4$	$-e_1$
e_6	e_3	e_7	$-e_1$	$-e_5$	e_4	−1	$-e_2$
e_7	$-e_5$	$-e_6$	e_4	$-e_3$	e_1	e_2	−1

split=1

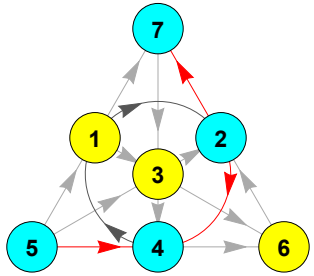
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	6	−2	−7	−3	5
2	−4	−1	−5	1	3	−7	6
3	−6	5	1	7	2	−1	4
4	2	−1	−7	−1	−6	5	3
5	7	−3	−2	6	1	4	1
6	3	7	1	−5	−4	1	2
7	−5	−6	−4	−3	−1	−2	1

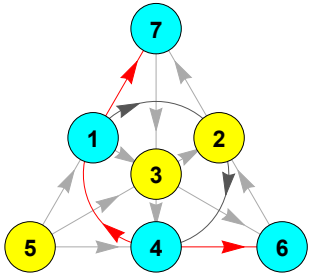
split=2

Fano plane



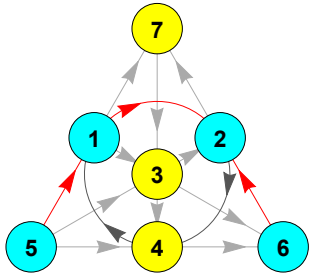
split=4

Fano plane



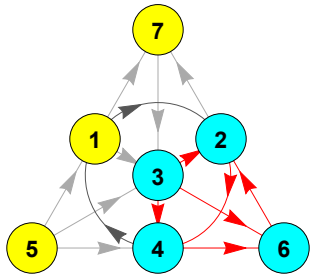
split=6

Fano plane



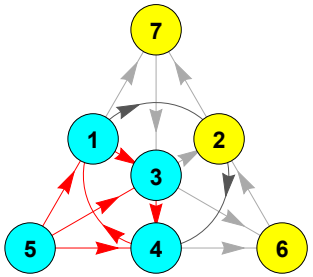
split=3

Fano plane



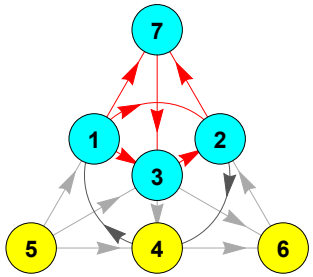
split=5

Fano plane



split=7

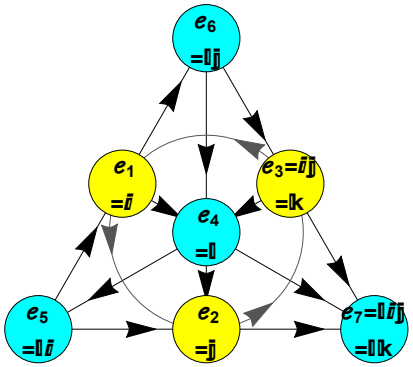
Fano plane



flip=True

{1, 2, 3}{1, 4, 7}{1, 6, 5}{2, 6, 4}{2, 7, 5}{3, 4, 5}{3, 7, 6}

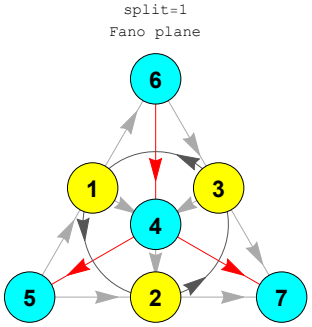
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	e_7	$-e_6$	e_5	$-e_4$
e_2	$-e_3$	−1	e_1	$-e_6$	$-e_7$	e_4	e_5
e_3	e_2	$-e_1$	−1	e_5	$-e_4$	$-e_7$	e_6
e_4	$-e_7$	e_6	$-e_5$	−1	e_3	$-e_2$	e_1
e_5	e_6	e_7	e_4	$-e_3$	−1	$-e_1$	$-e_2$
e_6	$-e_5$	$-e_4$	e_7	e_2	e_1	−1	$-e_3$
e_7	e_4	$-e_5$	$-e_6$	$-e_1$	e_2	e_3	−1

split=1

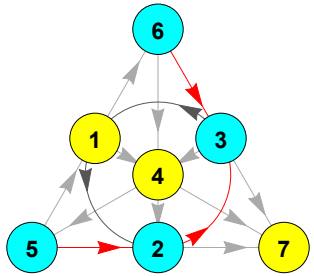
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	7	−6	5	−4
2	−3	−1	1	−6	−7	4	5
3	2	−1	−1	5	−4	−7	6
4	−7	6	−5	1	−3	2	−1
5	6	7	4	3	1	1	2
6	−5	−4	7	−2	−1	1	3
7	4	−5	−6	1	−2	−3	1

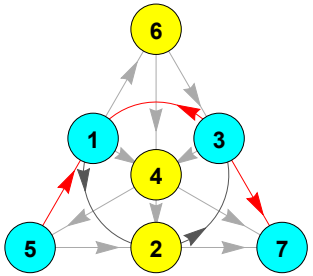
split=2

Fano plane



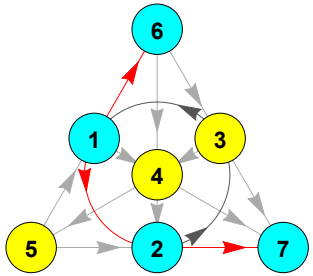
split=4

Fano plane



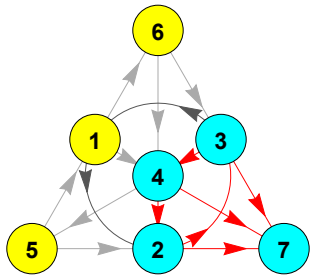
split=6

Fano plane



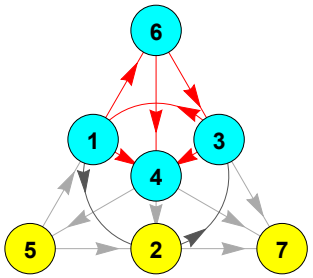
split=3

Fano plane



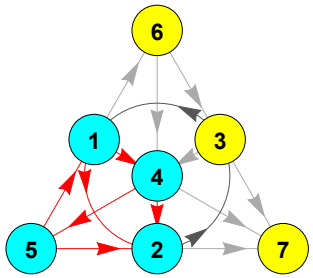
split=5

Fano plane



split=7

Fano plane

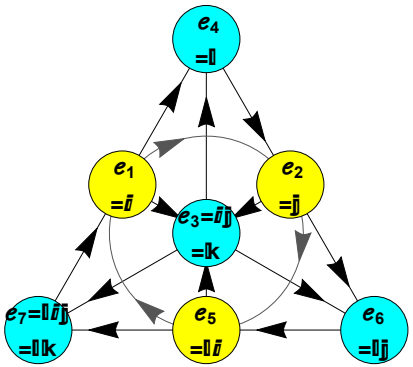


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
54	$\overline{\mu}^{\,+\to 0}_{\gamma_m\ \mathbb{t}}$		0apggsscc 010101000_2	Bn{ E8{	1 0	0 −1	0 0	0 0	1 −1	0 0	1 0	0 0	} }	$\overline{\text{Ag}}$ 47

flip=False

{1, 2, 5}{1, 3, 6}{1, 4, 7}{2, 3, 7}{2, 6, 4}{3, 4, 5}{5, 7, 6}

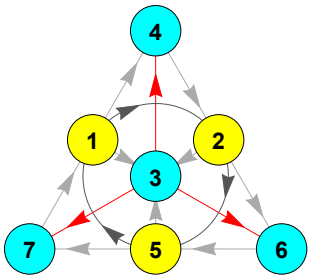
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	e_6	e_7	$-e_2$	$-e_3$	$-e_4$
e_2	e_2	$-e_5$	−1	e_7	$-e_6$	e_1	e_4	$-e_3$
e_3	e_3	$-e_6$	$-e_7$	−1	e_5	$-e_4$	e_1	e_2
e_4	e_4	$-e_7$	e_6	$-e_5$	−1	e_3	$-e_2$	e_1
e_5	e_5	e_2	$-e_1$	e_4	$-e_3$	−1	$-e_7$	e_6
e_6	e_6	e_3	$-e_4$	$-e_1$	e_2	e_7	−1	$-e_5$
e_7	e_7	e_4	e_3	$-e_2$	$-e_1$	$-e_6$	e_5	−1

split=1

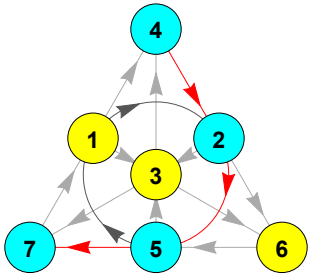
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	6	7	−2	−3	−4
2	−5	−1	7	−6	1	4	−3
3	−6	−7	1	−5	−4	−1	−2
4	−7	6	5	1	3	2	−1
5	2	−1	4	−3	−1	−7	6
6	3	−4	1	−2	7	1	5
7	4	3	2	1	−6	−5	1

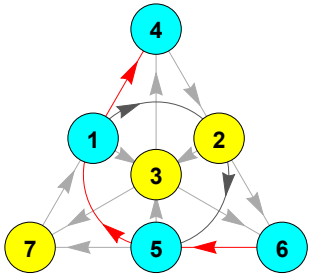
split=2

Fano plane



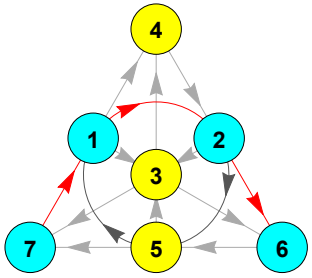
split=4

Fano plane



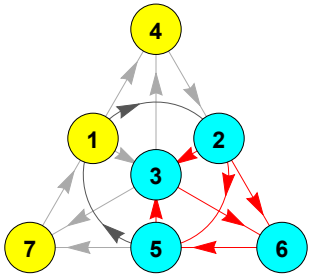
split=6

Fano plane



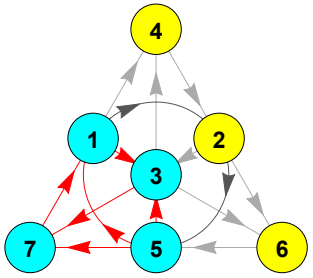
split=3

Fano plane



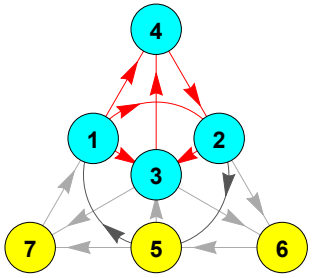
split=5

Fano plane



split=7

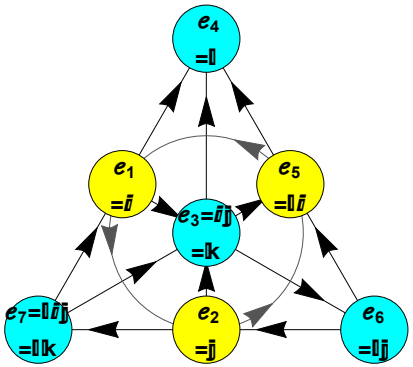
Fano plane



flip=True

{1, 2, 5}{1, 3, 6}{1, 4, 7}{2, 3, 4}{2, 7, 6}{3, 5, 7}{4, 6, 5}

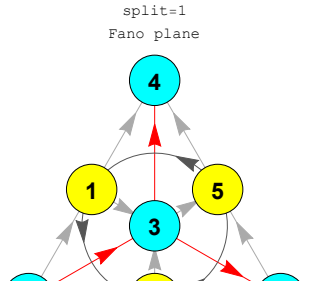
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	e_6	e_7	$-e_2$	$-e_3$	$-e_4$
e_2	e_2	$-e_5$	−1	e_4	$-e_3$	e_1	$-e_7$	e_6
e_3	e_3	$-e_6$	$-e_4$	−1	e_2	e_7	e_1	$-e_5$
e_4	e_4	$-e_7$	e_3	$-e_2$	−1	$-e_6$	e_5	e_1
e_5	e_5	e_2	$-e_1$	$-e_7$	e_6	−1	$-e_4$	e_3
e_6	e_6	e_3	e_7	$-e_1$	$-e_5$	e_4	−1	$-e_2$
e_7	e_7	e_4	$-e_6$	e_5	$-e_1$	$-e_3$	e_2	−1

split=1

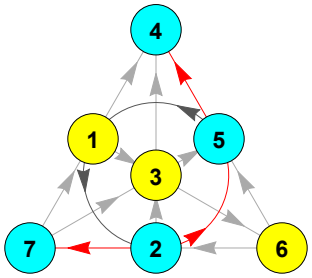
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	6	7	−2	−3	−4
2	−5	−1	4	−3	1	−7	6
3	−6	−4	1	−2	7	−1	5
4	−7	3	2	1	−6	−5	−1
5	2	−1	−7	6	−1	−4	3
6	3	7	1	5	4	1	2
7	4	−6	−5	1	−3	−2	1

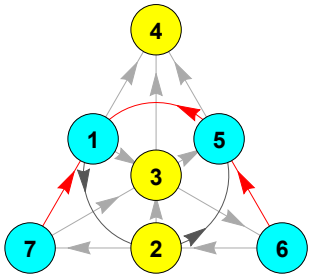
split=2

Fano plane



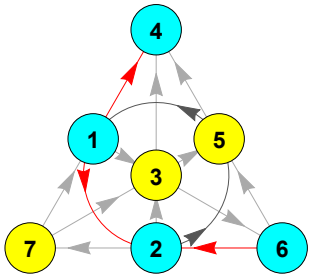
split=4

Fano plane



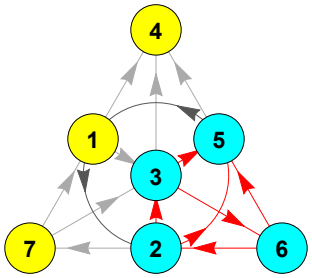
split=6

Fano plane



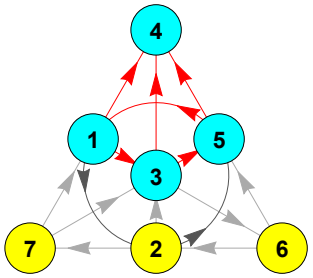
split=3

Fano plane



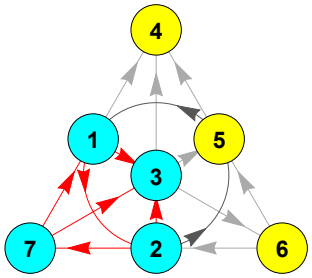
split=5

Fano plane



split=7

Fano plane

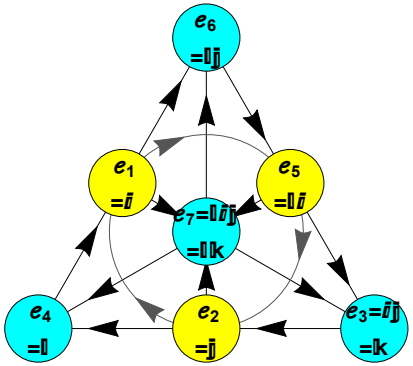


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
55	$C_{\mathbb{R}}^{0\to -1/3}$		0apggsscc 001101101_2	Bn{ E8{	1 0	0 −1	0 0	0 0	1 0	0 −1	0 0	1 0	} }	$\overline{Zr}$ 40

flip=False

{1, 5, 2}{1, 7, 3}{1, 6, 4}{2, 4, 3}{2, 7, 6}{3, 6, 5}{4, 5, 7}

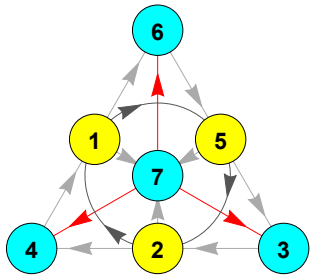
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_7$	$-e_6$	e_2	e_4	e_3
e_2	e_5	−1	$-e_4$	e_3	$-e_1$	$-e_7$	e_6
e_3	e_7	e_4	−1	$-e_2$	$-e_6$	e_5	$-e_1$
e_4	e_6	$-e_3$	e_2	−1	e_7	$-e_1$	$-e_5$
e_5	$-e_2$	e_1	e_6	$-e_7$	−1	$-e_3$	e_4
e_6	$-e_4$	e_7	$-e_5$	e_1	e_3	−1	$-e_2$
e_7	$-e_3$	$-e_6$	e_1	e_5	$-e_4$	e_2	−1

split=1

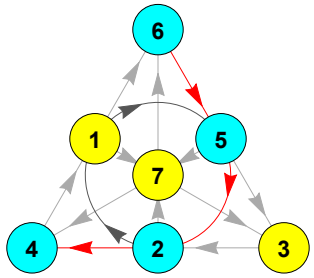
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−7	−6	2	4	3
2	5	−1	−4	3	−1	−7	6
3	7	4	1	2	−6	−5	1
4	6	−3	−2	1	7	1	5
5	−2	1	6	−7	−1	−3	4
6	−4	7	5	−1	3	1	2
7	−3	−6	−1	−5	−4	−2	1

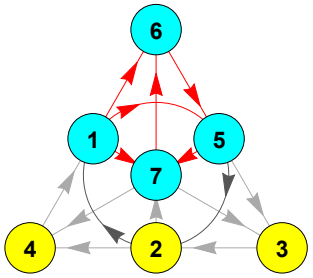
split=2

Fano plane



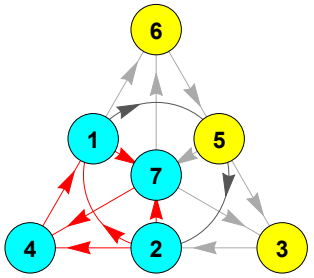
split=4

Fano plane



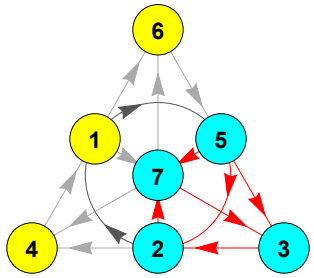
split=6

Fano plane



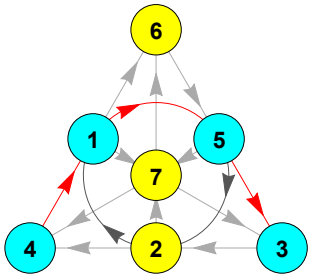
split=3

Fano plane



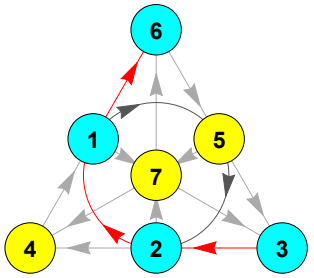
split=5

Fano plane



split=7

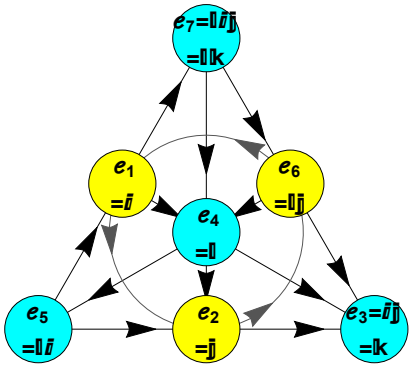
Fano plane



flip=True

{1, 2, 6}{1, 4, 3}{1, 7, 5}{2, 3, 5}{2, 7, 4}{3, 7, 6}{4, 5, 6}

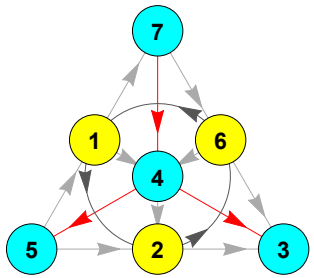
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_4$	e_3	$-e_7$	$-e_2$	e_5
e_2	$-e_6$	−1	e_5	$-e_7$	$-e_3$	e_1	e_4
e_3	e_4	$-e_5$	−1	$-e_1$	e_2	$-e_7$	e_6
e_4	$-e_3$	e_7	e_1	−1	e_6	$-e_5$	$-e_2$
e_5	e_7	e_3	$-e_2$	$-e_6$	−1	e_4	$-e_1$
e_6	e_2	$-e_1$	e_7	e_5	$-e_4$	−1	$-e_3$
e_7	$-e_5$	$-e_4$	$-e_6$	e_2	e_1	e_3	−1

split=1

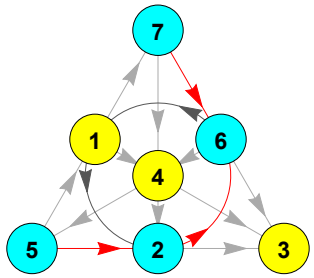
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−4	3	−7	−2	5
2	−6	−1	5	−7	−3	1	4
3	4	−5	1	1	−2	−7	−6
4	−3	7	−1	1	−6	−5	2
5	7	3	2	6	1	4	1
6	2	−1	7	5	−4	−1	−3
7	−5	−4	6	−2	−1	3	1

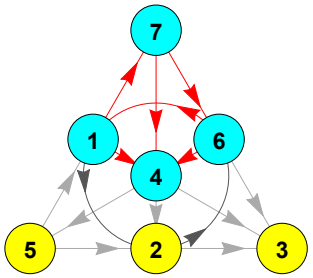
split=2

Fano plane



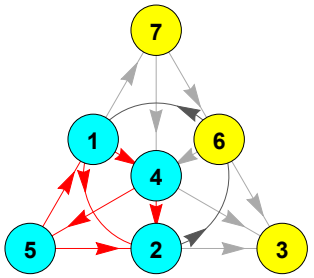
split=4

Fano plane



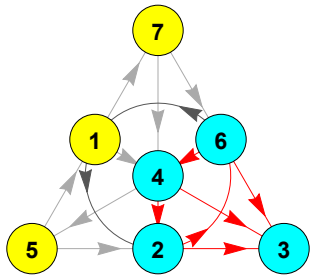
split=6

Fano plane



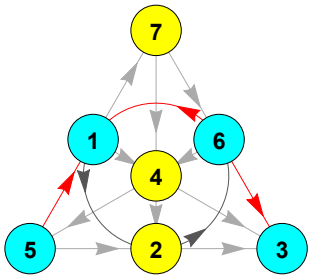
split=3

Fano plane



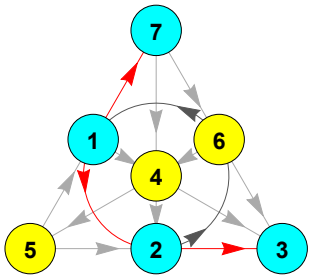
split=5

Fano plane



split=7

Fano plane

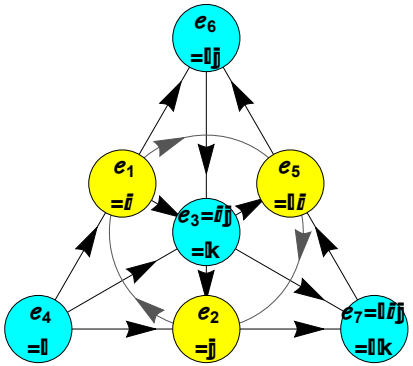


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
56	$C_{9m}^{0\to -1/3}$		0apggsscc 0011011110_2	Bn{ E8{	1 0	0 −1	0 0	0 0	0 0	1 0	1 −1	0 0	} }	$\overline{Br}$ 35

flip=False

{1, 5, 2}{1, 3, 7}{1, 6, 4}{2, 6, 3}{2, 7, 4}{3, 5, 4}{5, 6, 7}

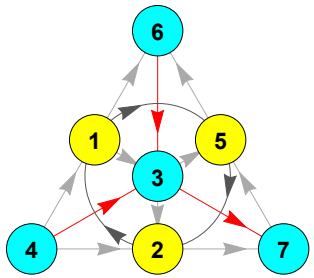
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_7	$-e_6$	e_2	e_4	$-e_3$
e_2	e_5	−1	$-e_6$	$-e_7$	$-e_1$	e_3	e_4
e_3	$-e_7$	e_6	−1	$-e_5$	e_4	$-e_2$	e_1
e_4	e_6	e_7	e_5	−1	$-e_3$	$-e_1$	$-e_2$
e_5	$-e_2$	e_1	$-e_4$	e_3	−1	e_7	$-e_6$
e_6	$-e_4$	$-e_3$	e_2	e_1	$-e_7$	−1	e_5
e_7	e_3	$-e_4$	$-e_1$	e_2	e_6	$-e_5$	−1

split=1

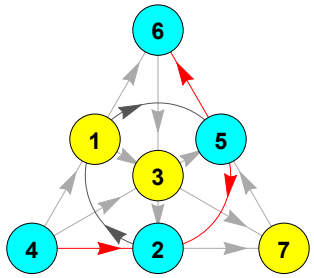
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	7	−6	2	4	−3
2	5	−1	−6	−7	−1	3	4
3	−7	6	1	5	4	2	−1
4	6	7	−5	1	−3	1	2
5	−2	1	−4	3	−1	7	−6
6	−4	−3	−2	−1	−7	1	−5
7	3	−4	1	−2	6	5	1

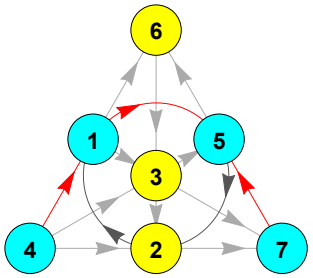
split=2

Fano plane



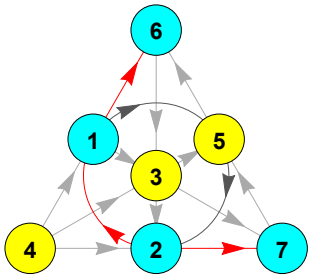
split=4

Fano plane



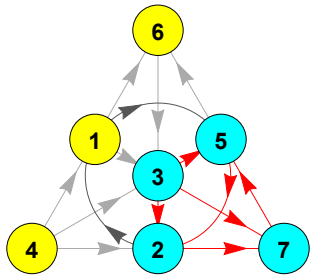
split=6

Fano plane



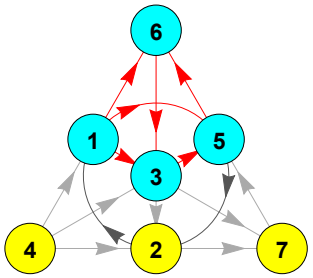
split=3

Fano plane



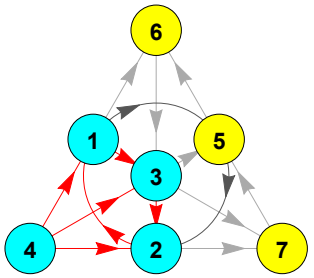
split=5

Fano plane



split=7

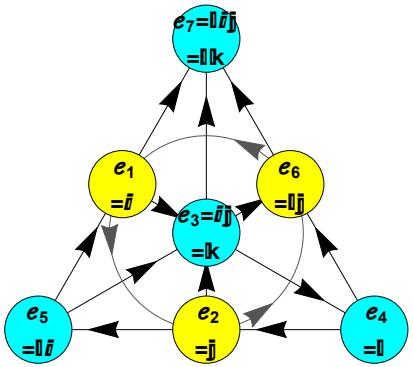
Fano plane



flip=True

{1, 2, 6}{1, 3, 4}{1, 7, 5}{2, 3, 7}{2, 5, 4}{3, 6, 5}{4, 6, 7}

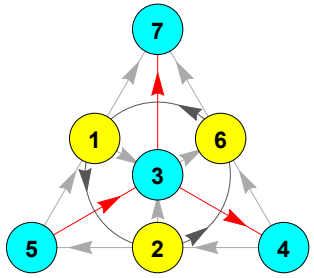
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	e_4	$-e_3$	$-e_7$	$-e_2$	e_5
e_2	$-e_6$	−1	e_7	$-e_5$	e_4	e_1	$-e_3$
e_3	$-e_4$	$-e_7$	−1	e_1	$-e_6$	e_5	e_2
e_4	e_3	e_5	$-e_1$	−1	$-e_2$	e_7	$-e_6$
e_5	e_7	$-e_4$	e_6	e_2	−1	$-e_3$	$-e_1$
e_6	e_2	$-e_1$	$-e_5$	$-e_7$	e_3	−1	e_4
e_7	$-e_5$	e_3	$-e_2$	e_6	e_1	$-e_4$	−1

split=1

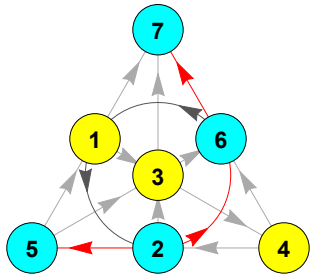
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	4	−3	−7	−2	5
2	−6	−1	7	−5	4	1	−3
3	−4	−7	1	−1	6	5	−2
4	3	5	1	1	2	7	6
5	7	−4	−6	−2	1	−3	1
6	2	−1	−5	−7	3	−1	4
7	−5	3	2	−6	−1	−4	1

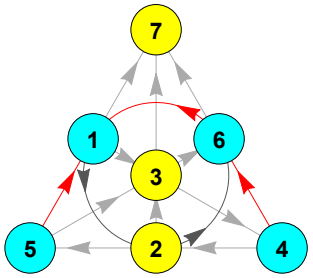
split=2

Fano plane



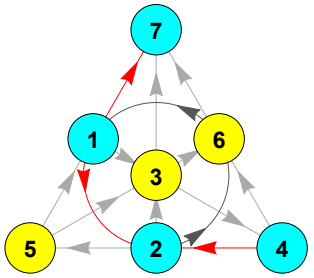
split=4

Fano plane



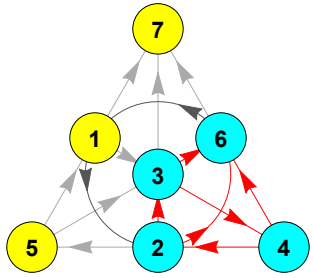
split=6

Fano plane



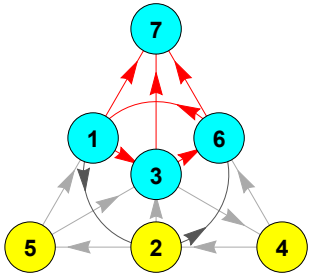
split=3

Fano plane



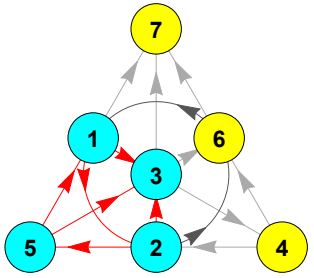
split=5

Fano plane



split=7

Fano plane

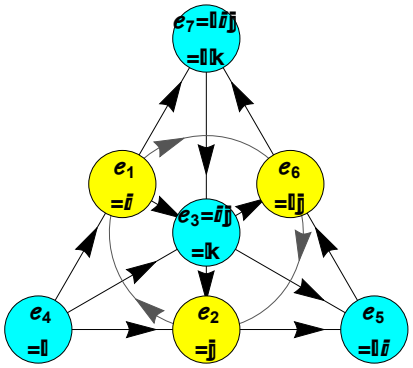


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
57	$C_{\mathbb{R}}^{2/3\to-1/3}$		0apggsscc 001101111_2	Bn{ E8{	1 0	0 -1	0 0	0 0	0 0	1 0	0 0	1 -1	} }	Md 101

flip=False

{1, 6, 2}{1, 3, 5}{1, 7, 4}{2, 7, 3}{2, 5, 4}{3, 6, 4}{5, 6, 7}

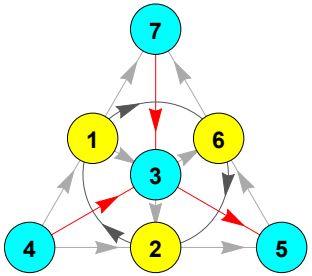
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_6$	e_5	$-e_7$	$-e_3$	e_2	e_4
e_2	e_6	-1	$-e_7$	$-e_5$	e_4	$-e_1$	e_3
e_3	$-e_5$	e_7	-1	$-e_6$	e_1	e_4	$-e_2$
e_4	e_7	e_5	e_6	-1	$-e_2$	$-e_3$	$-e_1$
e_5	e_3	$-e_4$	$-e_1$	e_2	-1	e_7	$-e_6$
e_6	$-e_2$	e_1	$-e_4$	e_3	$-e_7$	-1	e_5
e_7	$-e_4$	$-e_3$	e_2	e_1	e_6	$-e_5$	-1

split=1

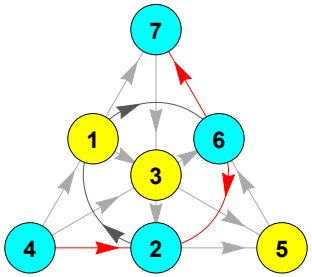
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	5	-7	-3	2	4
2	6	-1	-7	-5	4	-1	3
3	-5	7	1	6	-1	4	2
4	7	5	-6	1	2	-3	1
5	3	-4	1	-2	1	7	6
6	-2	1	-4	3	-7	-1	5
7	-4	-3	-2	-1	-6	-5	1

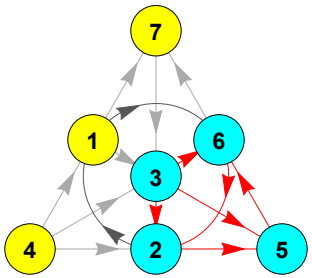
split=2

Fano plane



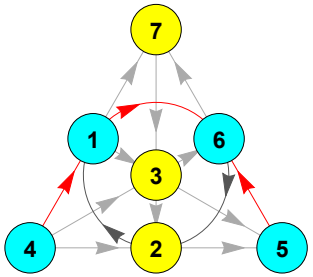
split=3

Fano plane



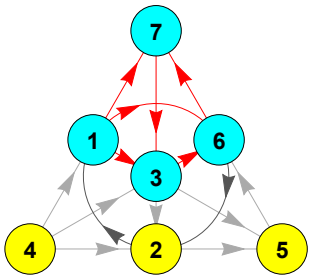
split=4

Fano plane



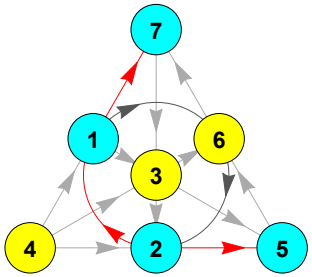
split=5

Fano plane



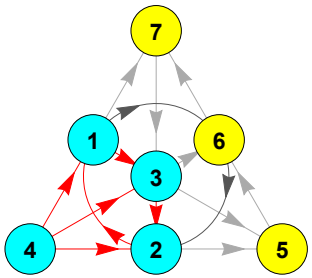
split=6

Fano plane



split=7

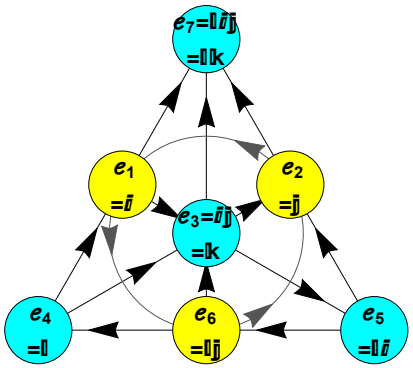
Fano plane



flip=True

{1, 6, 2}{1, 3, 5}{1, 7, 4}{2, 4, 3}{2, 7, 5}{3, 7, 6}{4, 5, 6}

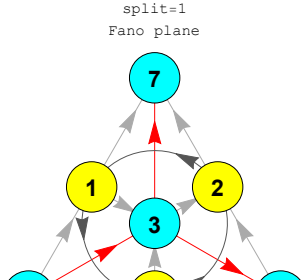
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_6$	e_5	$-e_7$	$-e_3$	e_2	e_4
e_2	e_6	-1	$-e_4$	e_3	$-e_7$	$-e_1$	e_5
e_3	$-e_5$	e_4	-1	$-e_2$	e_1	$-e_7$	e_6
e_4	e_7	$-e_3$	e_2	-1	e_6	$-e_5$	$-e_1$
e_5	e_3	e_7	$-e_1$	$-e_6$	-1	e_4	$-e_2$
e_6	$-e_2$	e_1	e_7	e_5	$-e_4$	-1	$-e_3$
e_7	$-e_4$	$-e_5$	$-e_6$	e_1	e_2	e_3	-1

split=1

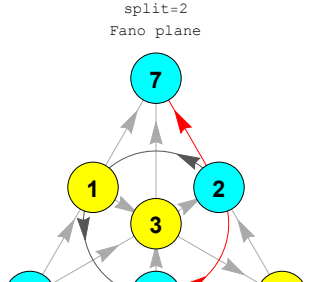
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	5	-7	-3	2	4
2	6	-1	-4	3	-7	-1	5
3	-5	4	1	2	-1	-7	-6
4	7	-3	-2	1	-6	-5	1
5	3	7	1	6	1	4	2
6	-2	1	7	5	-4	-1	-3
7	-4	-5	6	-1	-2	3	1

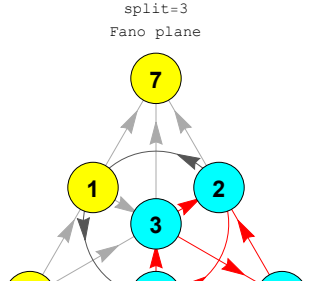
split=2

Fano plane



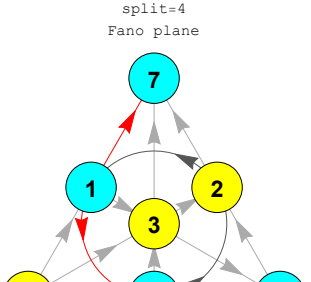
split=3

Fano plane



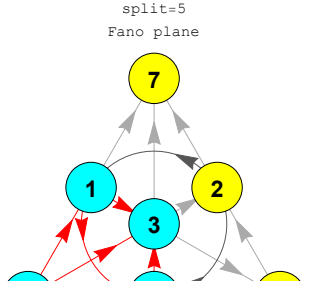
split=4

Fano plane



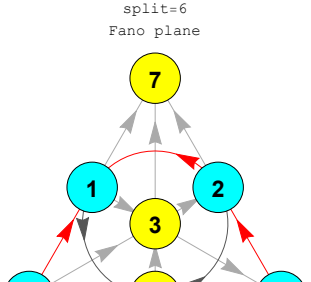
split=5

Fano plane



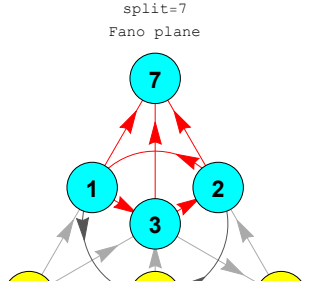
split=6

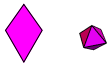
Fano plane



split=7

Fano plane

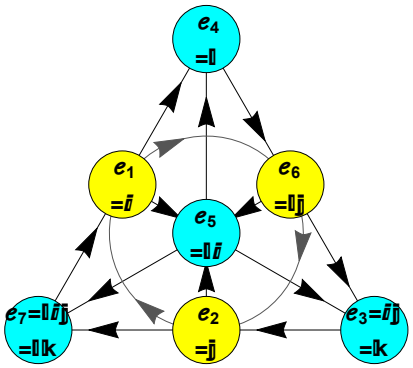


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
58	$\overline{s}^{1/3}_{m_m}$ t		0apggsscc 010101011_2	Bn{ 1 0 0 0 0 0 1 1 } E8{ 0 −1 0 0 0 0 0 1 }	$\overline{\overline{\text{Uue}}}$ 119

flip=False

{1, 6, 2}{1, 5, 3}{1, 4, 7}{2, 7, 3}{2, 5, 4}{3, 4, 6}{5, 7, 6}

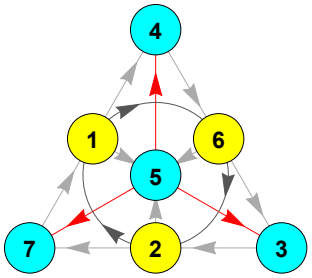
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_5$	e_7	e_3	e_2	$-e_4$
e_2	e_6	−1	$-e_7$	$-e_5$	e_4	$-e_1$	e_3
e_3	e_5	e_7	−1	e_6	$-e_1$	$-e_4$	$-e_2$
e_4	$-e_7$	e_5	$-e_6$	−1	$-e_2$	e_3	e_1
e_5	$-e_3$	$-e_4$	e_1	e_2	−1	$-e_7$	e_6
e_6	$-e_2$	e_1	e_4	$-e_3$	e_7	−1	$-e_5$
e_7	e_4	$-e_3$	e_2	$-e_1$	$-e_6$	e_5	−1

split=1

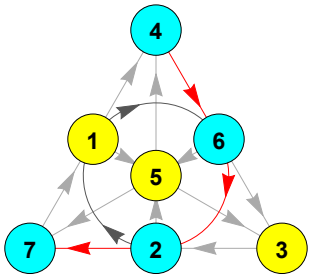
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−5	7	3	2	−4
2	6	−1	−7	−5	4	−1	3
3	5	7	1	−6	1	−4	2
4	−7	5	6	1	2	3	−1
5	−3	−4	−1	−2	1	−7	−6
6	−2	1	4	−3	7	−1	−5
7	4	−3	−2	1	6	5	1

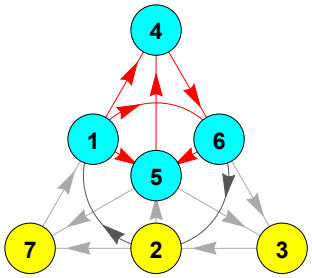
split=2

Fano plane



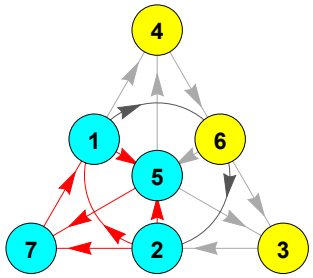
split=4

Fano plane



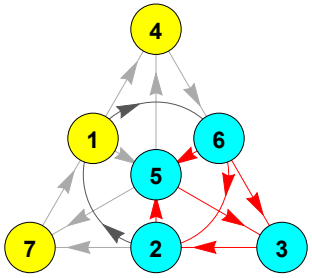
split=6

Fano plane



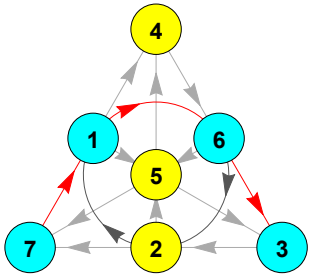
split=3

Fano plane



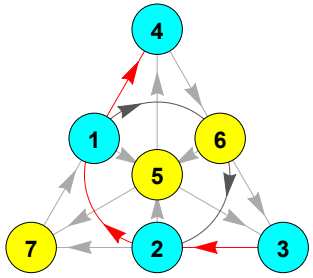
split=5

Fano plane



split=7

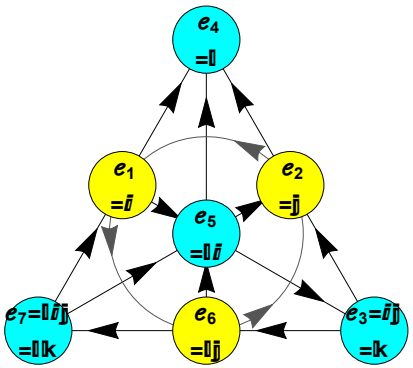
Fano plane



flip=True

{1, 6, 2}{1, 5, 3}{1, 4, 7}{2, 4, 3}{2, 7, 5}{3, 6, 7}{4, 6, 5}

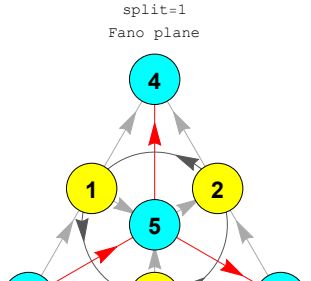
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_5$	e_7	e_3	e_2	$-e_4$
e_2	e_6	−1	$-e_4$	e_3	$-e_7$	$-e_1$	e_5
e_3	e_5	e_4	−1	$-e_2$	$-e_1$	e_7	$-e_6$
e_4	$-e_7$	$-e_3$	e_2	−1	$-e_6$	e_5	e_1
e_5	$-e_3$	e_7	e_1	e_6	−1	$-e_4$	$-e_2$
e_6	$-e_2$	e_1	$-e_7$	$-e_5$	e_4	−1	e_3
e_7	e_4	$-e_5$	e_6	$-e_1$	e_2	$-e_3$	−1

split=1

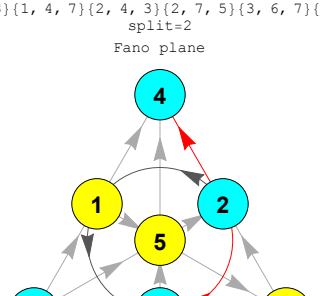
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−5	7	3	2	−4
2	6	−1	−4	3	−7	−1	5
3	5	4	1	2	1	7	6
4	−7	−3	−2	1	6	5	−1
5	−3	7	−1	−6	1	−4	2
6	−2	1	−7	−5	4	−1	3
7	4	−5	−6	1	−2	−3	1

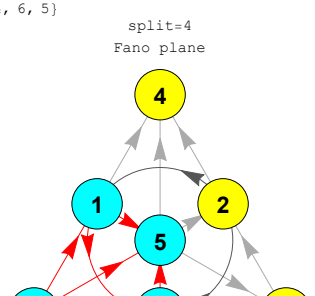
split=2

Fano plane



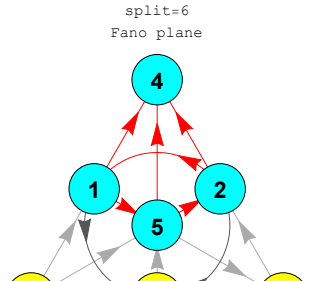
split=4

Fano plane



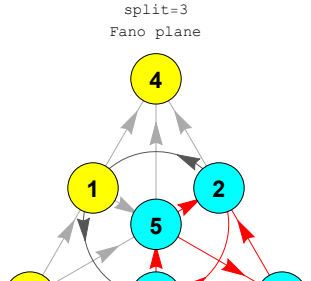
split=6

Fano plane



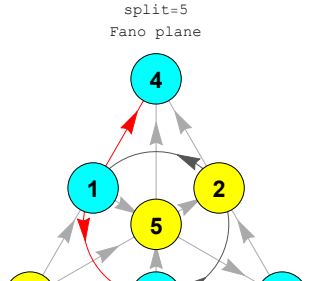
split=3

Fano plane



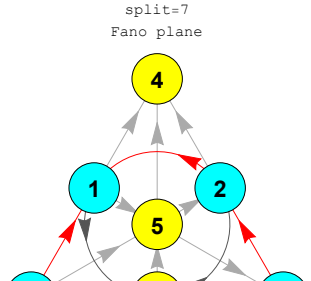
split=5

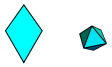
Fano plane



split=7

Fano plane

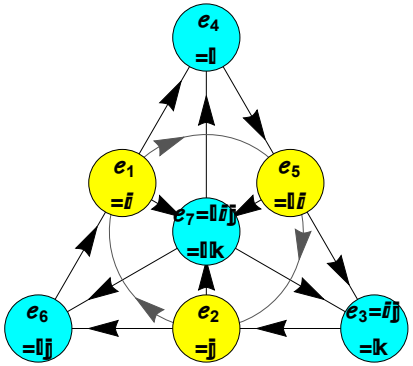


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
59	$\overline{\underset{c_m}{s}}^{\,+\to 1/3}_{L}$		0apggsscc 010101010_2	Bn{ E8{	0 0	1 −1	1 0	1 0	0 0	0 0	0 1	0 0	} }	$\overline{Se}$ 34

flip=False

{1, 5, 2}{1, 7, 3}{1, 4, 6}{2, 6, 3}{2, 7, 4}{3, 4, 5}{5, 7, 6}

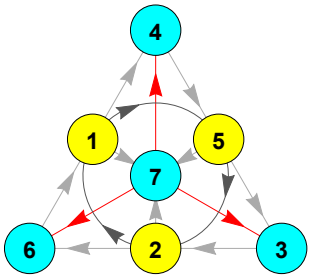
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_7$	e_6	e_2	$-e_4$	e_3
e_2	e_5	−1	$-e_6$	$-e_7$	$-e_1$	e_3	e_4
e_3	e_7	e_6	−1	e_5	$-e_4$	$-e_2$	$-e_1$
e_4	$-e_6$	e_7	$-e_5$	−1	e_3	e_1	$-e_2$
e_5	$-e_2$	e_1	e_4	$-e_3$	−1	$-e_7$	e_6
e_6	e_4	$-e_3$	e_2	$-e_1$	e_7	−1	$-e_5$
e_7	$-e_3$	$-e_4$	e_1	e_2	$-e_6$	e_5	−1

split=1

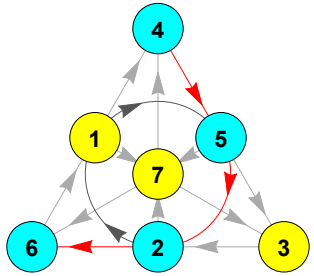
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−7	6	2	−4	3
2	5	−1	−6	−7	−1	3	4
3	7	6	1	−5	−4	2	1
4	−6	7	5	1	3	−1	2
5	−2	1	4	−3	−1	−7	6
6	4	−3	−2	1	7	1	5
7	−3	−4	−1	−2	−6	−5	1

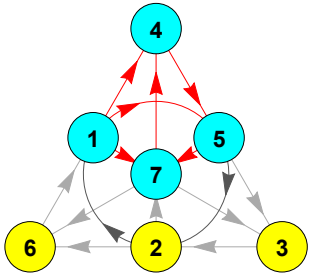
split=2

Fano plane



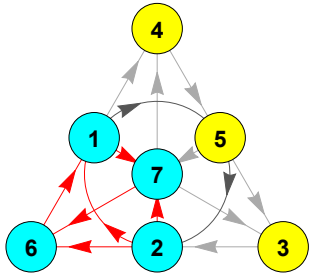
split=4

Fano plane



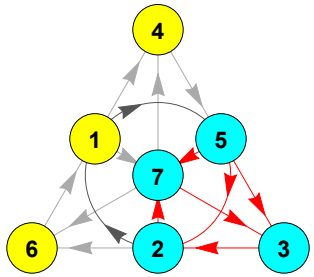
split=6

Fano plane



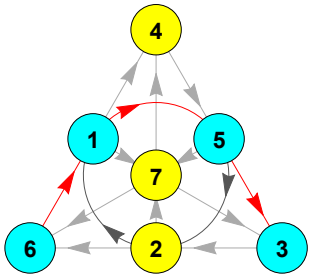
split=3

Fano plane



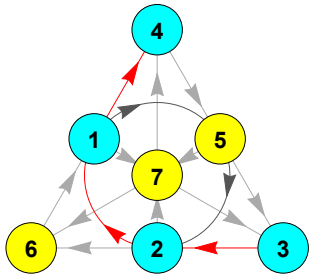
split=5

Fano plane



split=7

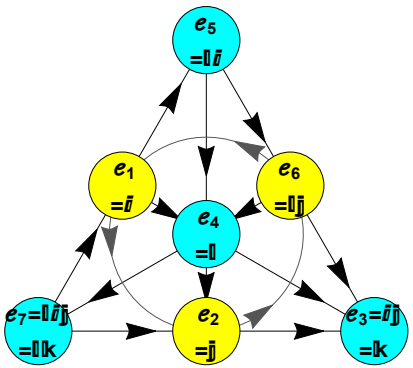
Fano plane



flip=True

{1, 2, 6}{1, 4, 3}{1, 5, 7}{2, 3, 7}{2, 5, 4}{3, 5, 6}{4, 7, 6}

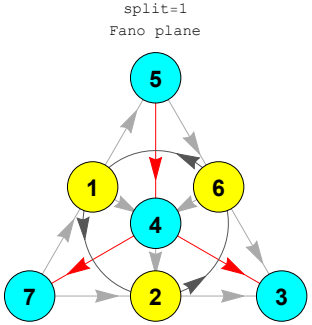
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_4$	e_3	e_7	$-e_2$	$-e_5$
e_2	$-e_6$	−1	e_7	$-e_5$	e_4	e_1	$-e_3$
e_3	e_4	$-e_7$	−1	e_1	e_6	$-e_5$	e_2
e_4	$-e_3$	e_5	e_1	−1	$-e_2$	$-e_7$	e_6
e_5	$-e_7$	$-e_4$	$-e_6$	e_2	−1	e_3	e_1
e_6	e_2	$-e_1$	e_5	e_7	$-e_3$	−1	$-e_4$
e_7	e_5	e_3	$-e_2$	$-e_6$	$-e_1$	e_4	−1

split=1

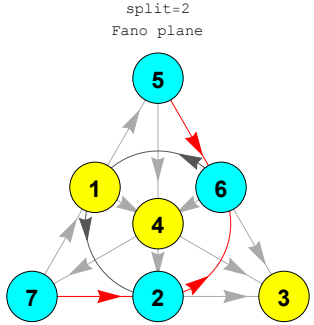
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−4	3	7	−2	−5
2	−6	−1	7	−5	4	1	−3
3	4	−7	1	1	−6	−5	−2
4	−3	5	−1	1	2	−7	−6
5	−7	−4	6	−2	1	3	−1
6	2	−1	5	7	−3	−1	−4
7	5	3	2	6	1	4	1

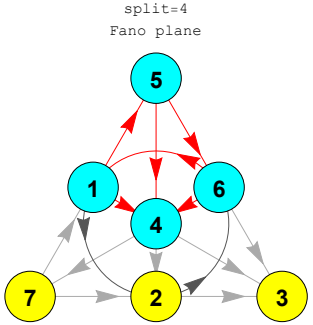
split=2

Fano plane



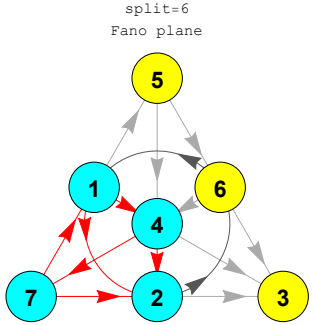
split=4

Fano plane



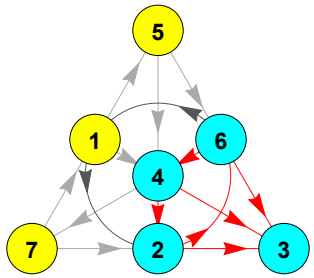
split=6

Fano plane



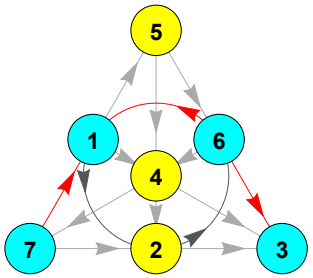
split=3

Fano plane



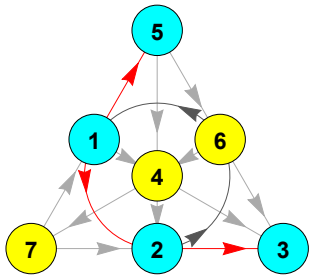
split=5

Fano plane



split=7

Fano plane

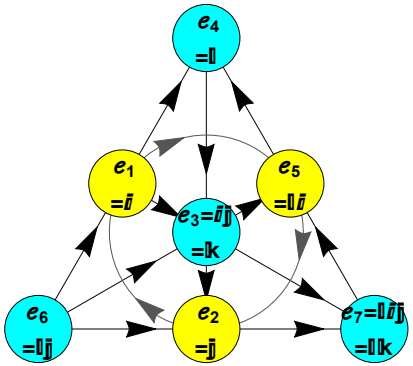


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates									Ele #
60	$\overline{\underset{\circ_m}{S}}^{+\to 1/3}_{t}$		0apggsscc	010101001_2	Bn{	0	1	1	0	1	0	0	0	}	$\overline{\text{Ni}}$ 28
					E8{	0	−1	0	0	0	1	0	0	}	

flip=False

{1, 5, 2}{1, 3, 7}{1, 4, 6}{2, 4, 3}{2, 7, 6}{3, 5, 6}{4, 7, 5}

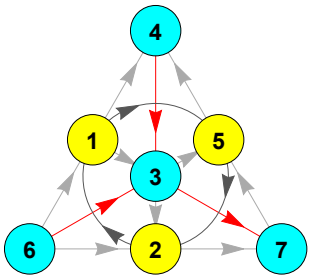
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_7	e_6	e_2	$-e_4$	$-e_3$
e_2	e_5	−1	$-e_4$	e_3	$-e_1$	$-e_7$	e_6
e_3	$-e_7$	e_4	−1	$-e_2$	e_6	$-e_5$	e_1
e_4	$-e_6$	$-e_3$	e_2	−1	$-e_7$	e_1	e_5
e_5	$-e_2$	e_1	$-e_6$	e_7	−1	e_3	$-e_4$
e_6	e_4	e_7	e_5	$-e_1$	$-e_3$	−1	$-e_2$
e_7	e_3	$-e_6$	$-e_1$	$-e_5$	e_4	e_2	−1

split=1

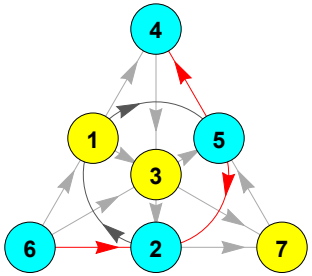
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	7	6	2	−4	−3
2	5	−1	−4	3	−1	−7	6
3	−7	4	1	2	6	5	−1
4	−6	−3	−2	1	−7	−1	−5
5	−2	1	−6	7	−1	3	−4
6	4	7	−5	1	−3	1	2
7	3	−6	1	5	4	−2	1

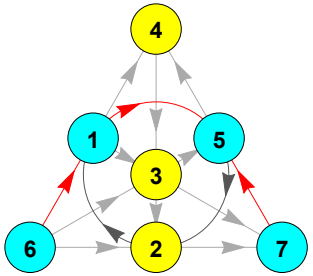
split=2

Fano plane



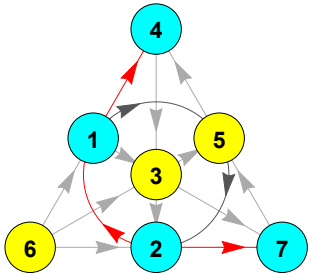
split=4

Fano plane



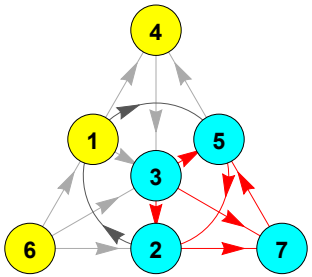
split=6

Fano plane



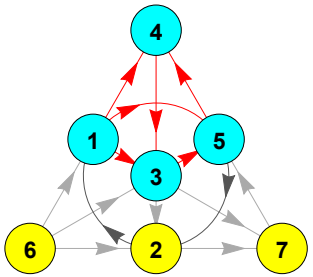
split=3

Fano plane



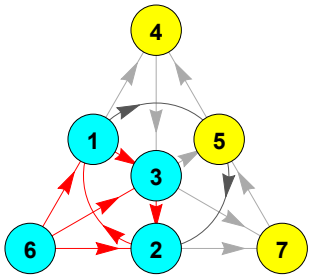
split=5

Fano plane



split=7

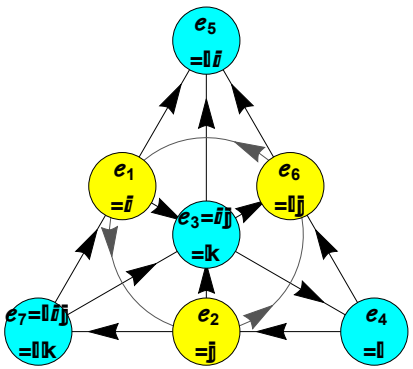
Fano plane



flip=True

{1, 2, 6}{1, 3, 4}{1, 5, 7}{2, 3, 5}{2, 7, 4}{3, 6, 7}{4, 6, 5}

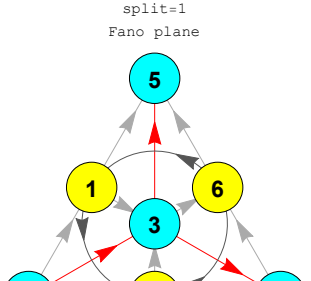
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	e_4	$-e_3$	e_7	$-e_2$	$-e_5$
e_2	$-e_6$	−1	e_5	$-e_7$	$-e_3$	e_1	e_4
e_3	$-e_4$	$-e_5$	−1	e_1	e_2	e_7	$-e_6$
e_4	e_3	e_7	$-e_1$	−1	$-e_6$	e_5	$-e_2$
e_5	$-e_7$	e_3	$-e_2$	e_6	−1	$-e_4$	e_1
e_6	e_2	$-e_1$	$-e_7$	$-e_5$	e_4	−1	e_3
e_7	e_5	$-e_4$	e_6	e_2	$-e_1$	$-e_3$	−1

split=1

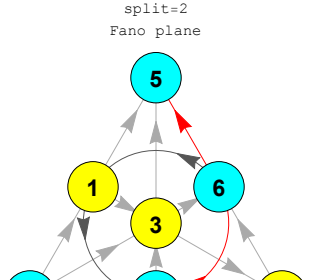
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	4	−3	7	−2	−5
2	−6	−1	5	−7	−3	1	4
3	−4	−5	1	−1	−2	7	6
4	3	7	1	1	6	5	2
5	−7	3	2	−6	1	−4	−1
6	2	−1	−7	−5	4	−1	3
7	5	−4	−6	−2	1	−3	1

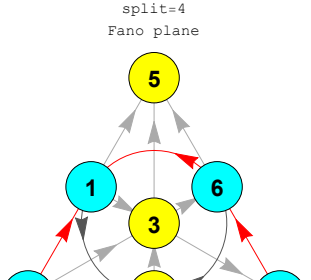
split=2

Fano plane



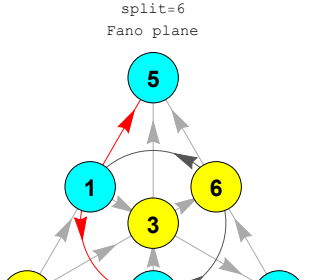
split=4

Fano plane



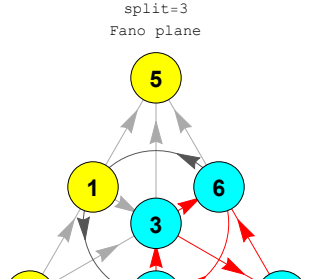
split=6

Fano plane



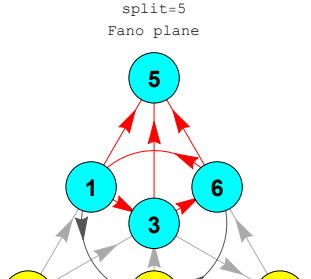
split=3

Fano plane



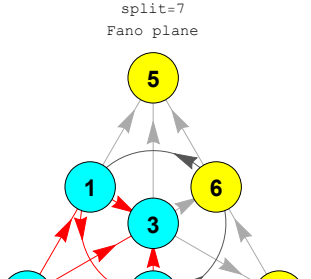
split=5

Fano plane



split=7

Fano plane

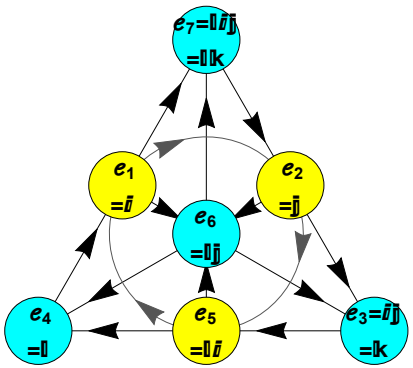


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates								Ele #
61	ν_{μ}		0apggsscc	Bn{	0	1	1	0	0	1	0	0 }	$\overline{Sc}$
	$^{0}_{wm}$ $^{0}_{R}$		001101100_2	E8{	0	-1	0	0	1	0	0	0 }	21

flip=False

{1, 2, 5}{1, 6, 3}{1, 7, 4}{2, 3, 7}{2, 6, 4}{3, 5, 4}{5, 6, 7}

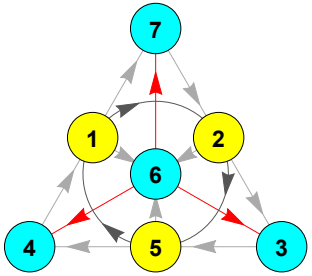
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	$-e_6$	$-e_7$	$-e_2$	e_3	e_4
e_2	$-e_5$	-1	e_7	$-e_6$	e_1	e_4	$-e_3$
e_3	e_6	$-e_7$	-1	$-e_5$	e_4	$-e_1$	e_2
e_4	e_7	e_6	e_5	-1	$-e_3$	$-e_2$	$-e_1$
e_5	e_2	$-e_1$	$-e_4$	e_3	-1	e_7	$-e_6$
e_6	$-e_3$	$-e_4$	e_1	e_2	$-e_7$	-1	e_5
e_7	$-e_4$	e_3	$-e_2$	e_1	e_6	$-e_5$	-1

split=1

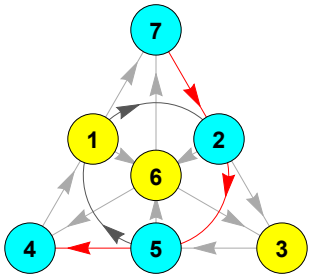
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	-6	-7	-2	3	4
2	-5	-1	7	-6	1	4	-3
3	6	-7	1	5	4	1	-2
4	7	6	-5	1	-3	2	1
5	2	-1	-4	3	-1	7	-6
6	-3	-4	-1	-2	-7	1	-5
7	-4	3	2	-1	6	5	1

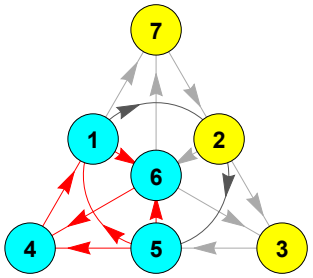
split=2

Fano plane



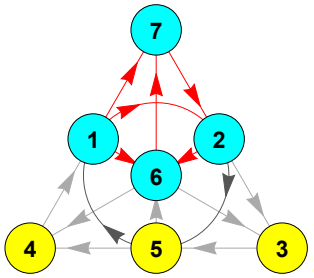
split=4

Fano plane



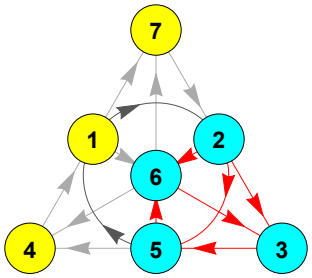
split=6

Fano plane



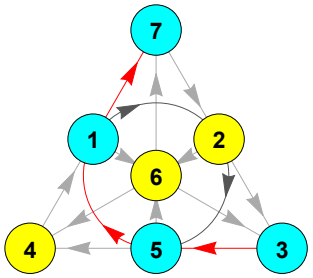
split=3

Fano plane



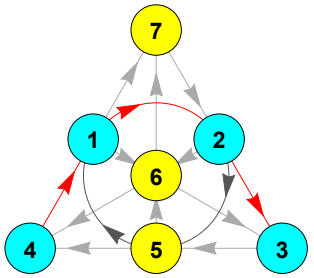
split=5

Fano plane



split=7

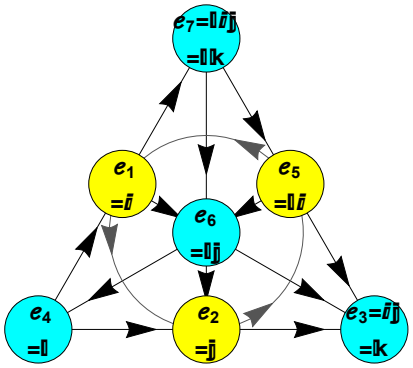
Fano plane



flip=True

{1, 2, 5}{1, 6, 3}{1, 7, 4}{2, 3, 4}{2, 7, 6}{3, 7, 5}{4, 5, 6}

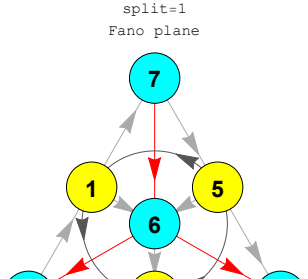
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	$-e_6$	$-e_7$	$-e_2$	e_3	e_4
e_2	$-e_5$	-1	e_4	$-e_3$	e_1	$-e_7$	e_6
e_3	e_6	$-e_4$	-1	e_2	$-e_7$	$-e_1$	e_5
e_4	e_7	e_3	$-e_2$	-1	e_6	$-e_5$	$-e_1$
e_5	e_2	$-e_1$	e_7	$-e_6$	-1	e_4	$-e_3$
e_6	$-e_3$	e_7	e_1	e_5	$-e_4$	-1	$-e_2$
e_7	$-e_4$	$-e_6$	$-e_5$	e_1	e_3	e_2	-1

split=1

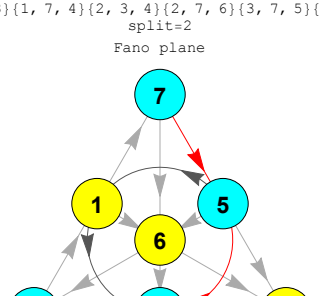
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	-6	-7	-2	3	4
2	-5	-1	4	-3	1	-7	6
3	6	-4	1	-2	-7	1	-5
4	7	3	2	1	6	5	1
5	2	-1	7	-6	-1	4	-3
6	-3	7	-1	-5	-4	1	2
7	-4	-6	5	-1	3	-2	1

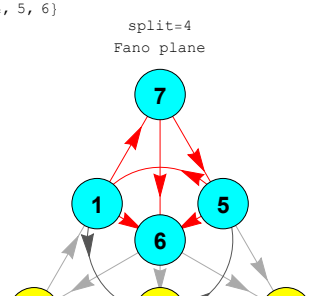
split=2

Fano plane



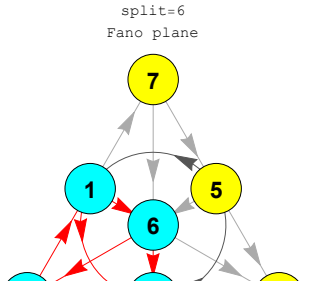
split=4

Fano plane



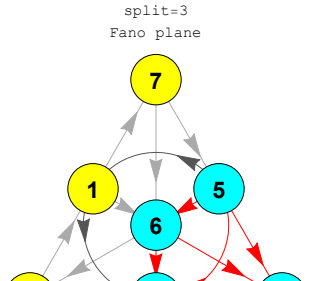
split=6

Fano plane



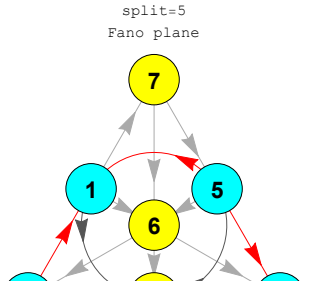
split=3

Fano plane



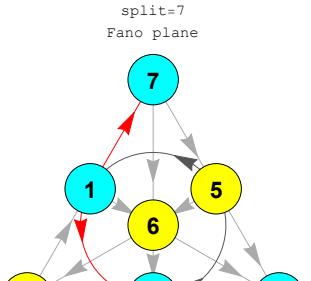
split=5

Fano plane



split=7

Fano plane

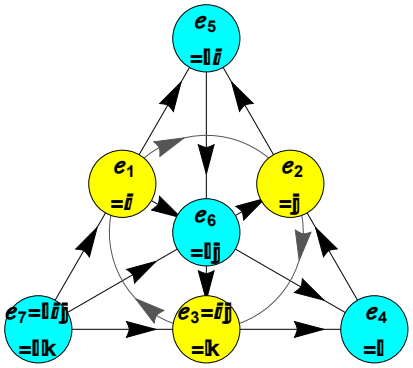


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
62	$e_5 \phi_{g_1}^{0\to -1}$			0apggsscc	Bn{	0	1	1	0	0	0	1	0 }	$\overline{Si}$
				001000110_2	E8{	0	-1	0	1	0	0	0	0 }	14

flip=False

{1, 2, 3}{1, 6, 4}{1, 5, 7}{2, 5, 4}{2, 7, 6}{3, 4, 7}{3, 5, 6}

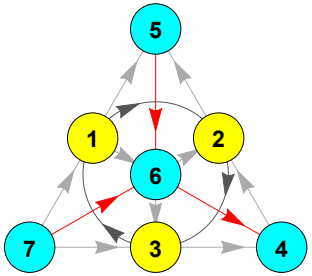
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	$-e_6$	e_7	e_4	$-e_5$
e_2	$-e_3$	-1	e_1	$-e_5$	e_4	$-e_7$	e_6
e_3	e_2	$-e_1$	-1	e_7	e_6	$-e_5$	$-e_4$
e_4	e_6	e_5	$-e_7$	-1	$-e_2$	$-e_1$	e_3
e_5	$-e_7$	$-e_4$	$-e_6$	e_2	-1	e_3	e_1
e_6	$-e_4$	e_7	e_5	e_1	$-e_3$	-1	$-e_2$
e_7	e_5	$-e_6$	e_4	$-e_3$	$-e_1$	e_2	-1

split=1

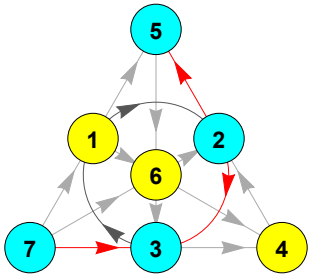
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	-6	7	4	-5
2	-3	-1	1	-5	4	-7	6
3	2	-1	-1	7	6	-5	-4
4	6	5	-7	1	2	1	-3
5	-7	-4	-6	-2	1	-3	-1
6	-4	7	5	-1	3	1	2
7	5	-6	4	3	1	-2	1

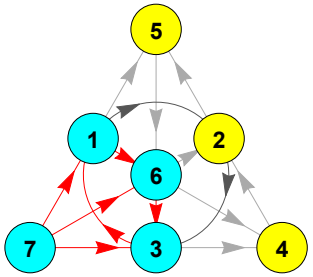
split=2

Fano plane



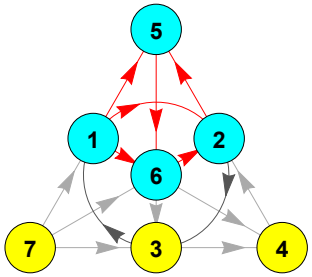
split=4

Fano plane



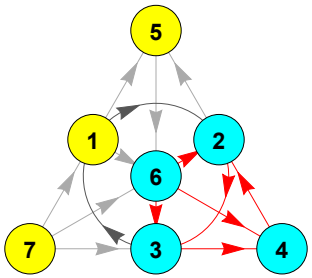
split=6

Fano plane



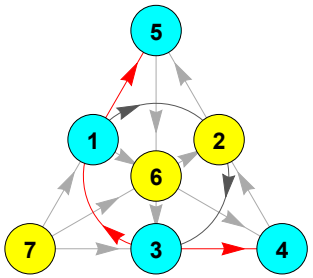
split=3

Fano plane



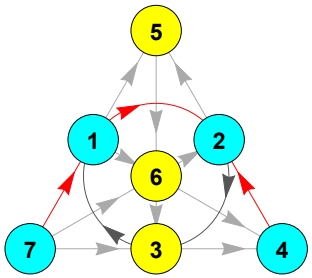
split=5

Fano plane



split=7

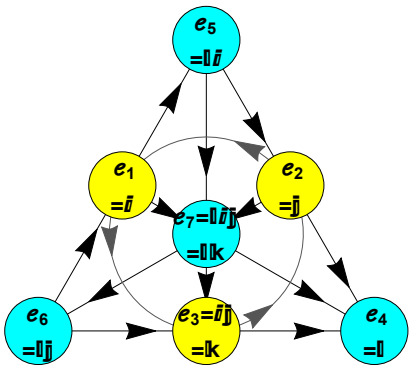
Fano plane



flip=True

{1, 3, 2}{1, 7, 4}{1, 5, 6}{2, 4, 5}{2, 7, 6}{3, 4, 6}{3, 5, 7}

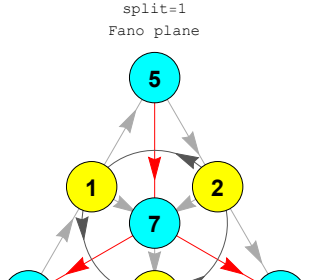
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_7$	e_6	$-e_5$	e_4
e_2	e_3	-1	$-e_1$	e_5	$-e_4$	$-e_7$	e_6
e_3	$-e_2$	e_1	-1	e_6	e_7	$-e_4$	$-e_5$
e_4	e_7	$-e_5$	$-e_6$	-1	e_2	e_3	$-e_1$
e_5	$-e_6$	e_4	$-e_7$	$-e_2$	-1	e_1	e_3
e_6	e_5	e_7	e_4	$-e_3$	$-e_1$	-1	$-e_2$
e_7	$-e_4$	$-e_6$	e_5	e_1	$-e_3$	e_2	-1

split=1

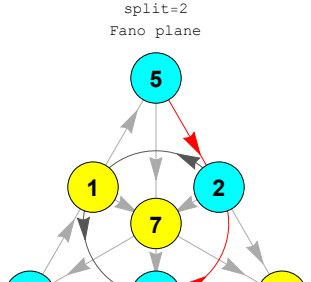
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-7	6	-5	4
2	3	-1	-1	5	-4	-7	6
3	-2	1	-1	6	7	-4	-5
4	7	-5	-6	1	-2	-3	1
5	-6	4	-7	2	1	-1	-3
6	5	7	4	3	1	1	2
7	-4	-6	5	-1	3	-2	1

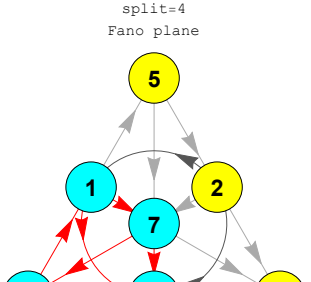
split=2

Fano plane



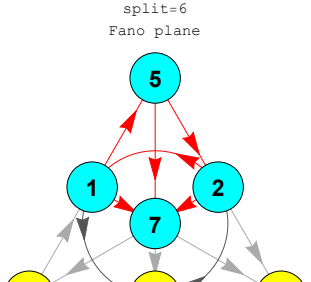
split=4

Fano plane



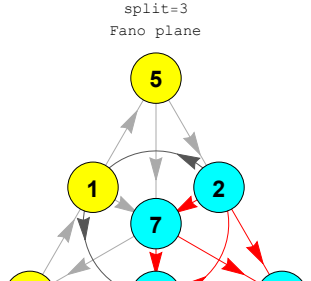
split=6

Fano plane



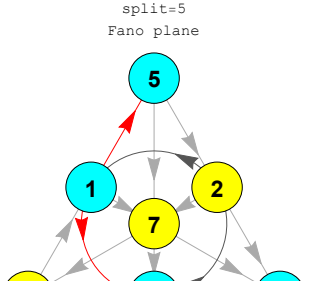
split=3

Fano plane



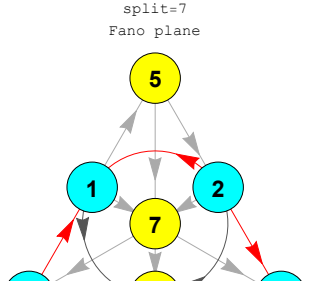
split=5

Fano plane



split=7

Fano plane

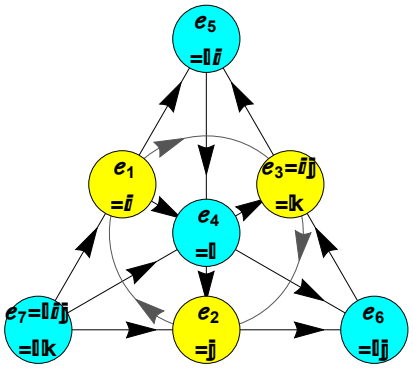


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates								Ele #
63	$e_T \phi^{0}_{g_m t}$		0apggsscc	Bn{	0	1	1	0	0	0	0	1	}	$\overline{N}$
			001001010_2	E8{	0	-1	1	0	0	0	0	0	}	7

flip=False

{1, 3, 2}{1, 4, 6}{1, 5, 7}{2, 5, 4}{2, 6, 7}{3, 7, 4}{3, 5, 6}

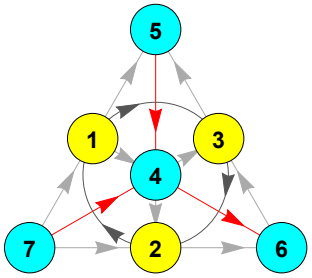
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	e_6	e_7	$-e_4$	$-e_5$
e_2	e_3	-1	$-e_1$	$-e_5$	e_4	e_7	$-e_6$
e_3	$-e_2$	e_1	-1	$-e_7$	e_6	$-e_5$	e_4
e_4	$-e_6$	e_5	e_7	-1	$-e_2$	e_1	$-e_3$
e_5	$-e_7$	$-e_4$	$-e_6$	e_2	-1	e_3	e_1
e_6	e_4	$-e_7$	e_5	$-e_1$	$-e_3$	-1	e_2
e_7	e_5	e_6	$-e_4$	e_3	$-e_1$	$-e_2$	-1

split=1

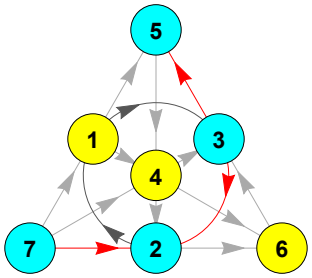
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	6	7	-4	-5
2	3	-1	-1	-5	4	7	-6
3	-2	1	-1	-7	6	-5	4
4	-6	5	7	1	2	-1	3
5	-7	-4	-6	-2	1	-3	-1
6	4	-7	5	1	3	1	-2
7	5	6	-4	-3	1	2	1

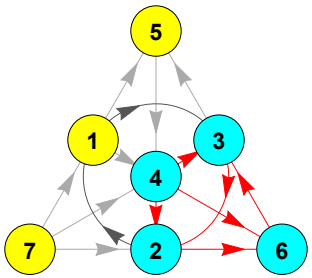
split=2

Fano plane



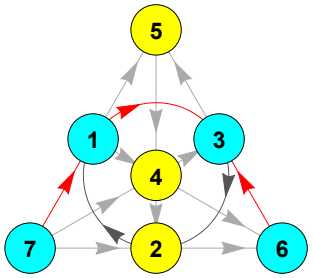
split=3

Fano plane



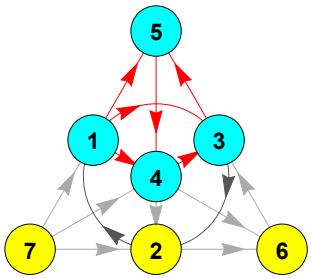
split=4

Fano plane



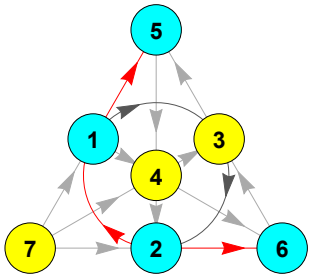
split=5

Fano plane



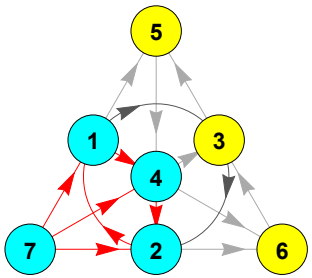
split=6

Fano plane



split=7

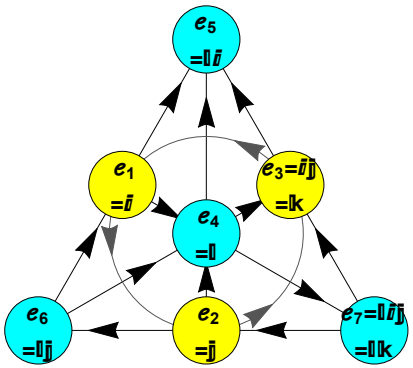
Fano plane



flip=True

{1, 2, 3}{1, 4, 7}{1, 5, 6}{2, 4, 5}{2, 6, 7}{3, 6, 4}{3, 5, 7}

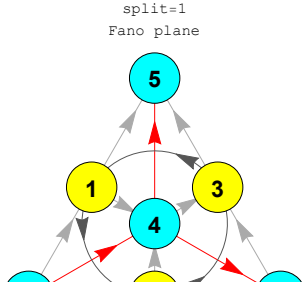
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_7	e_6	$-e_5$	$-e_4$
e_2	$-e_3$	-1	e_1	e_5	$-e_4$	e_7	$-e_6$
e_3	e_2	$-e_1$	-1	$-e_6$	e_7	e_4	$-e_5$
e_4	$-e_7$	$-e_5$	e_6	-1	e_2	$-e_3$	e_1
e_5	$-e_6$	e_4	$-e_7$	$-e_2$	-1	e_1	e_3
e_6	e_5	$-e_7$	$-e_4$	e_3	$-e_1$	-1	e_2
e_7	e_4	e_6	e_5	$-e_1$	$-e_3$	$-e_2$	-1

split=1

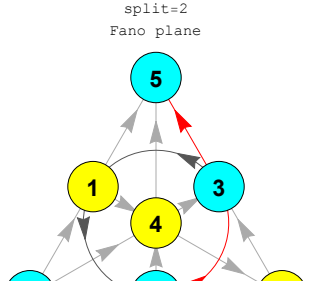
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	7	6	-5	-4
2	-3	-1	1	5	-4	7	-6
3	2	-1	-1	-6	7	4	-5
4	-7	-5	6	1	-2	3	-1
5	-6	4	-7	2	1	-1	-3
6	5	-7	-4	-3	1	1	-2
7	4	6	5	1	3	2	1

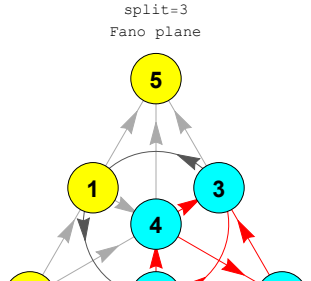
split=2

Fano plane



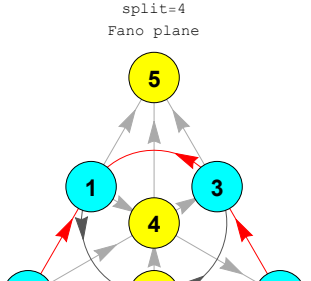
split=3

Fano plane



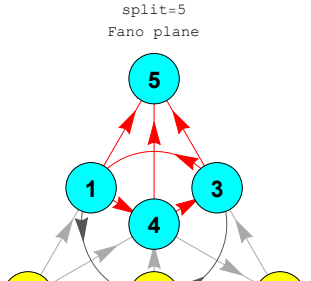
split=4

Fano plane



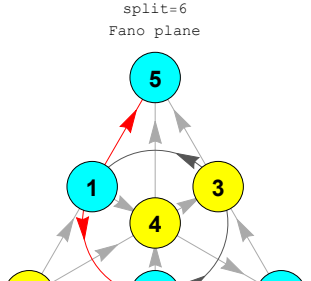
split=5

Fano plane



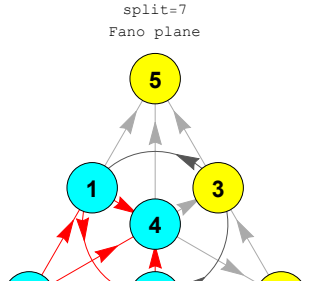
split=6

Fano plane



split=7

Fano plane

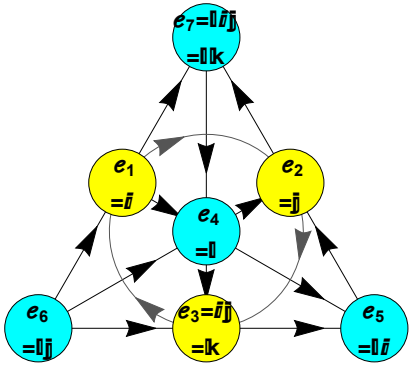


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates									Ele #
64	$\omega_{L}^{0\to1}$		0apggsscc	001001101$_2$	Bn{	0	1	0	1	1	0	0	0	}	$\overline{\text{Pd}}$
					E8{	0	0	−1	−1	0	0	0	0	}	46

flip=False

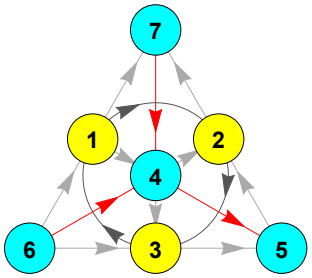
{1, 2, 3}{1, 4, 5}{1, 7, 6}{2, 6, 4}{2, 7, 5}{3, 7, 4}{3, 5, 6}

Fano plane



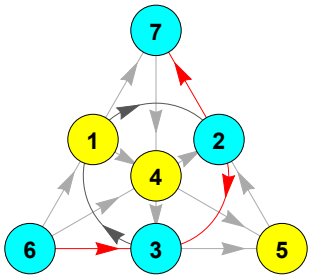
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	e_5	$-e_4$	$-e_7$	e_6
e_2	$-e_3$	−1	e_1	$-e_6$	$-e_7$	e_4	e_5
e_3	e_2	$-e_1$	−1	$-e_7$	e_6	$-e_5$	e_4
e_4	$-e_5$	e_6	e_7	−1	e_1	$-e_2$	$-e_3$
e_5	e_4	e_7	$-e_6$	$-e_1$	−1	e_3	$-e_2$
e_6	e_7	$-e_4$	e_5	e_2	$-e_3$	−1	$-e_1$
e_7	$-e_6$	$-e_5$	$-e_4$	e_3	e_2	e_1	−1

split=1
Fano plane

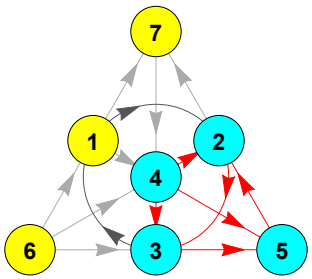


0↦1	1	2	3	4	5	6	7
1	−1	3	−2	5	−4	−7	6
2	−3	−1	1	−6	−7	4	5
3	2	−1	−1	−7	6	−5	4
4	−5	6	7	1	−1	2	3
5	4	7	−6	1	1	−3	2
6	7	−4	5	−2	3	1	1
7	−6	−5	−4	−3	−2	−1	1

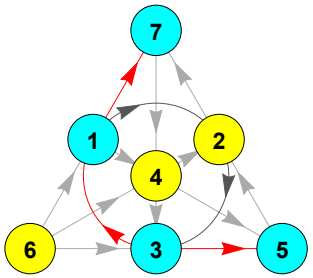
split=2
Fano plane



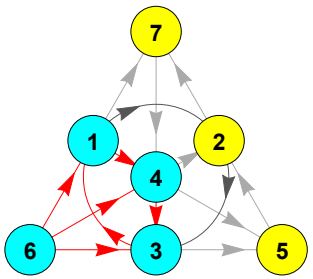
split=3
Fano plane



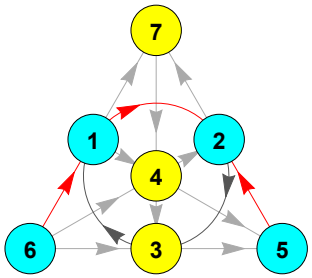
split=4
Fano plane



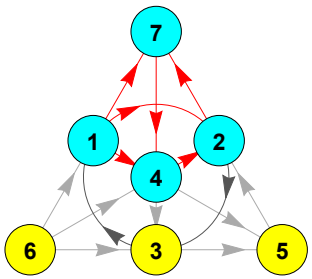
split=5
Fano plane



split=6
Fano plane



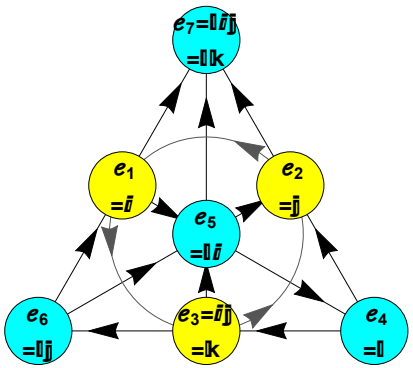
split=7
Fano plane



flip=True

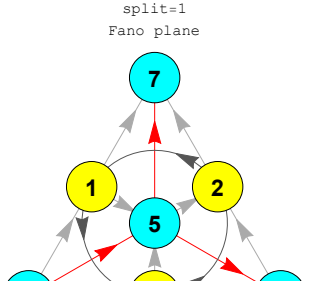
{1, 3, 2}{1, 5, 4}{1, 7, 6}{2, 7, 4}{2, 6, 5}{3, 6, 4}{3, 5, 7}

Fano plane



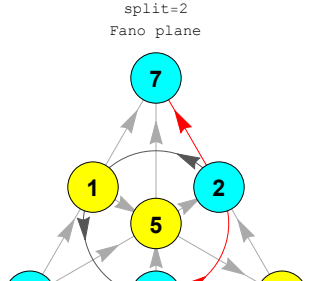
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	$-e_5$	e_4	$-e_7$	e_6
e_2	e_3	−1	$-e_1$	$-e_7$	$-e_6$	e_5	e_4
e_3	$-e_2$	e_1	−1	$-e_6$	e_7	e_4	$-e_5$
e_4	e_5	e_7	e_6	−1	$-e_1$	$-e_3$	$-e_2$
e_5	$-e_4$	e_6	$-e_7$	e_1	−1	$-e_2$	e_3
e_6	e_7	$-e_5$	$-e_4$	e_3	e_2	−1	$-e_1$
e_7	$-e_6$	$-e_4$	e_5	e_2	$-e_3$	e_1	−1

split=1
Fano plane

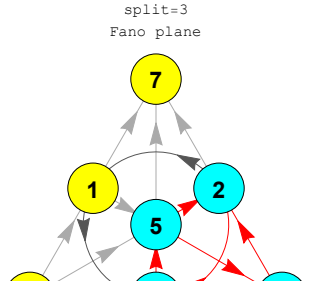


0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−5	4	−7	6
2	3	−1	−1	−7	−6	5	4
3	−2	1	−1	−6	7	4	−5
4	5	7	6	1	1	3	2
5	−4	6	−7	−1	1	2	−3
6	7	−5	−4	−3	−2	1	1
7	−6	−4	5	−2	3	−1	1

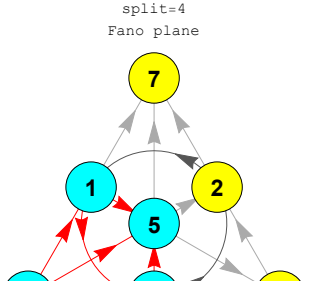
split=2
Fano plane



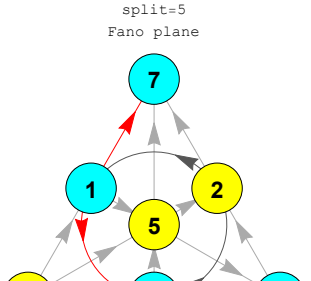
split=3
Fano plane



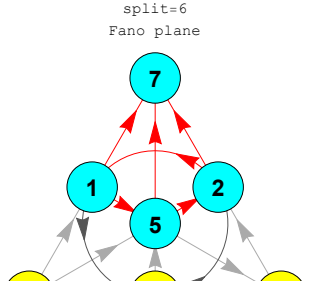
split=4
Fano plane



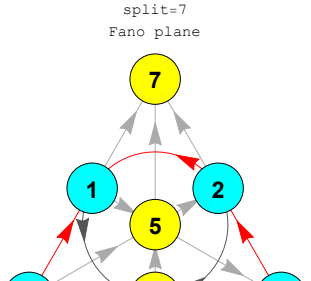
split=5
Fano plane



split=6
Fano plane



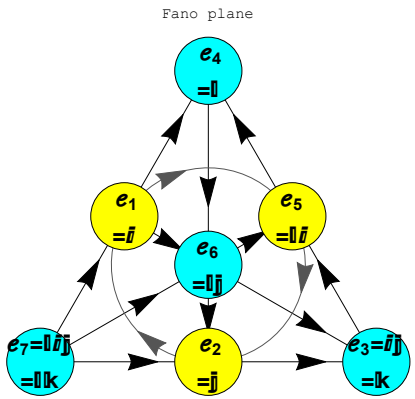
split=7
Fano plane



Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
65	$\overset{\mu}{\underset{y_1}{}}\overset{t\to 0}{\underset{R}{}}$		0apggsscc 010100100_2	Bn{ E8{	0 0	1 0	0 −1	1 0	0 −1	1 0	0 0	0 0	} }	$\overline{Sr}$ 38

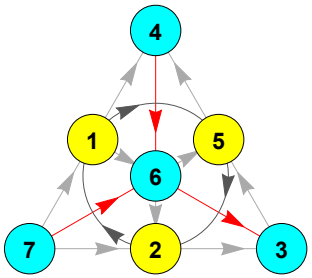
flip=False

{1, 5, 2}{1, 6, 3}{1, 4, 7}{2, 3, 7}{2, 4, 6}{3, 5, 4}{5, 7, 6}



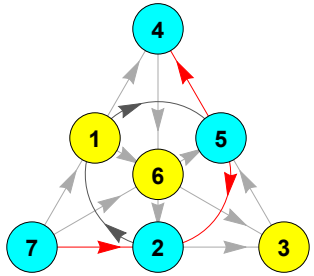
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_6$	e_7	e_2	e_3	$-e_4$
e_2	e_5	−1	e_7	e_6	$-e_1$	$-e_4$	$-e_3$
e_3	e_6	$-e_7$	−1	$-e_5$	e_4	$-e_1$	e_2
e_4	$-e_7$	$-e_6$	e_5	−1	$-e_3$	e_2	e_1
e_5	$-e_2$	e_1	$-e_4$	e_3	−1	$-e_7$	e_6
e_6	$-e_3$	e_4	e_1	$-e_2$	e_7	−1	$-e_5$
e_7	e_4	e_3	$-e_2$	$-e_1$	$-e_6$	e_5	−1

split=1
Fano plane

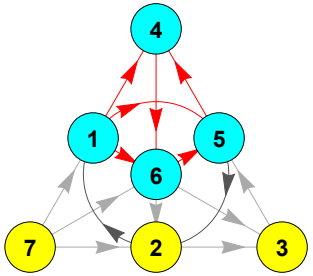


0↦1	1	2	3	4	5	6	7
1	−1	−5	−6	7	2	3	−4
2	5	−1	7	6	−1	−4	−3
3	6	−7	1	5	4	1	−2
4	−7	−6	−5	1	−3	−2	−1
5	−2	1	−4	3	−1	−7	6
6	−3	4	−1	2	7	1	5
7	4	3	2	1	−6	−5	1

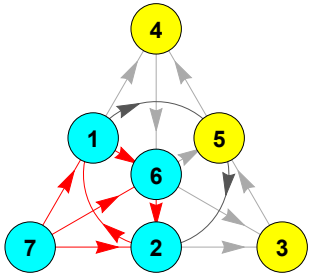
split=2
Fano plane



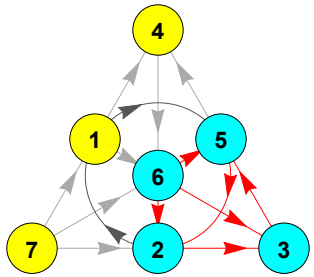
split=4
Fano plane



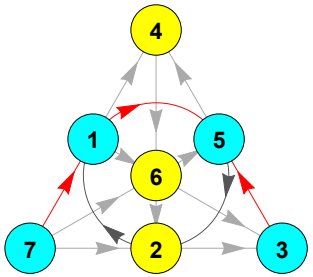
split=6
Fano plane



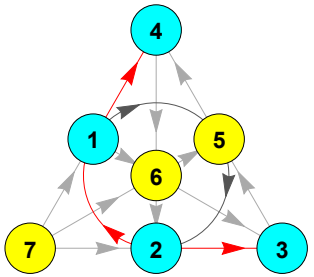
split=3
Fano plane



split=5
Fano plane

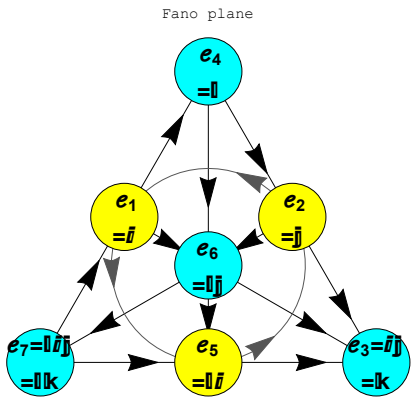


split=7
Fano plane



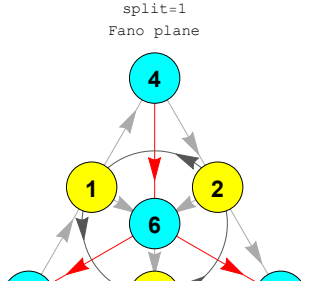
flip=True

{1, 5, 2}{1, 6, 3}{1, 4, 7}{2, 3, 4}{2, 6, 7}{3, 7, 5}{4, 6, 5}



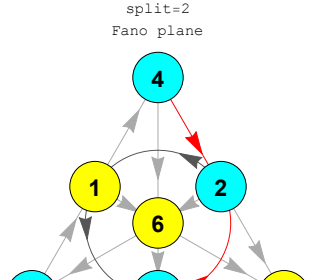
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_6$	e_7	e_2	e_3	$-e_4$
e_2	e_5	−1	e_4	$-e_3$	$-e_1$	e_7	$-e_6$
e_3	e_6	$-e_4$	−1	e_2	$-e_7$	$-e_1$	e_5
e_4	$-e_7$	e_3	$-e_2$	−1	$-e_6$	e_5	e_1
e_5	$-e_2$	e_1	e_7	e_6	−1	$-e_4$	$-e_3$
e_6	$-e_3$	$-e_7$	e_1	$-e_5$	e_4	−1	e_2
e_7	e_4	e_6	$-e_5$	$-e_1$	e_3	$-e_2$	−1

split=1
Fano plane

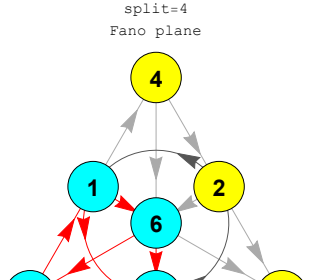


0↦1	1	2	3	4	5	6	7
1	−1	−5	−6	7	2	3	−4
2	5	−1	4	−3	−1	7	−6
3	6	−4	1	−2	−7	1	−5
4	−7	3	2	1	−6	−5	−1
5	−2	1	7	6	−1	−4	−3
6	−3	−7	−1	5	4	1	−2
7	4	6	5	1	3	2	1

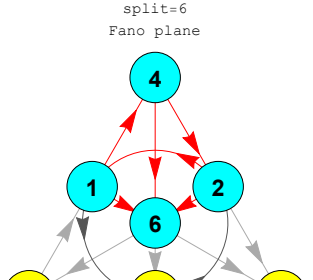
split=2
Fano plane



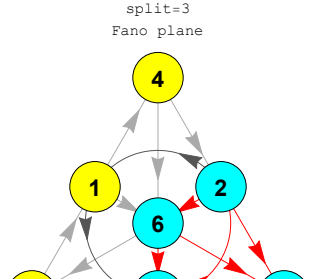
split=4
Fano plane



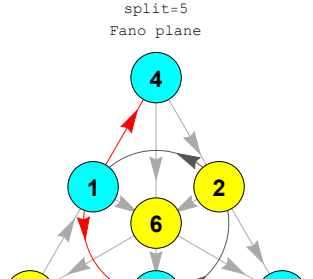
split=6
Fano plane



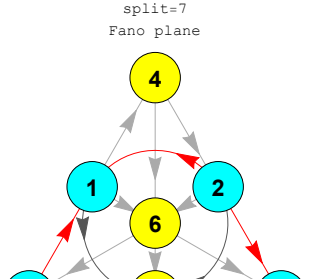
split=3
Fano plane



split=5
Fano plane



split=7
Fano plane

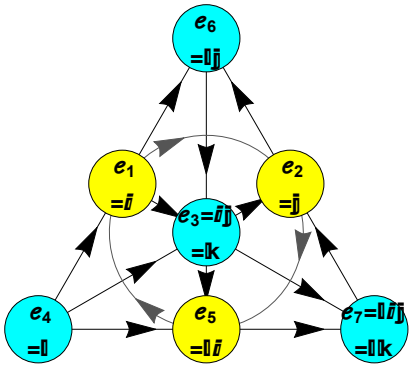


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
66	$c_{r_d}^{0\to -1/3}$		0apggsscc 0011000012	Bn{ E8{	0 0	1 0	0 −1	1 0	0 0	0 −1	1 0	0 0	} }	$\overline{Ge}$ 32

flip=False

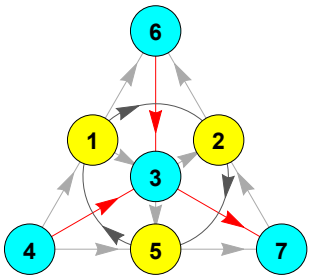
{1, 2, 5}{1, 3, 7}{1, 6, 4}{2, 4, 3}{2, 6, 7}{3, 5, 6}{4, 5, 7}

Fano plane



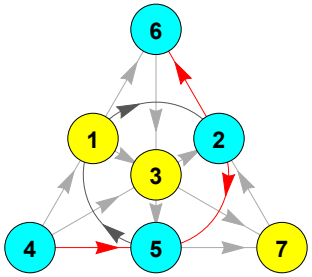
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_7	$-e_6$	$-e_2$	e_4	$-e_3$
e_2	$-e_5$	−1	$-e_4$	e_3	e_1	e_7	$-e_6$
e_3	$-e_7$	e_4	−1	$-e_2$	e_6	$-e_5$	e_1
e_4	e_6	$-e_3$	e_2	−1	e_7	$-e_1$	$-e_5$
e_5	e_2	$-e_1$	$-e_6$	$-e_7$	−1	e_3	e_4
e_6	$-e_4$	$-e_7$	e_5	e_1	$-e_3$	−1	e_2
e_7	e_3	e_6	$-e_1$	e_5	$-e_4$	$-e_2$	−1

split=1
Fano plane

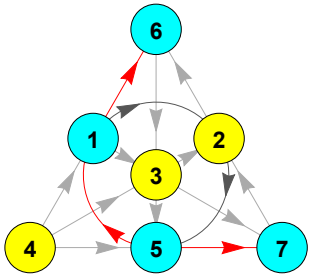


0↦1	1	2	3	4	5	6	7
1	−1	5	7	−6	−2	4	−3
2	−5	−1	−4	3	1	7	−6
3	−7	4	1	2	6	5	−1
4	6	−3	−2	1	7	1	5
5	2	−1	−6	−7	−1	3	4
6	−4	−7	−5	−1	−3	1	−2
7	3	6	1	−5	−4	2	1

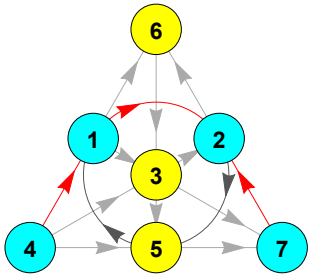
split=2
Fano plane



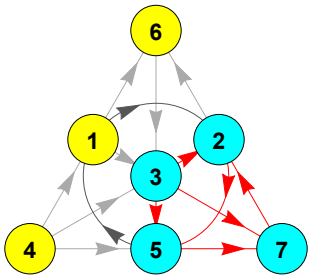
split=4
Fano plane



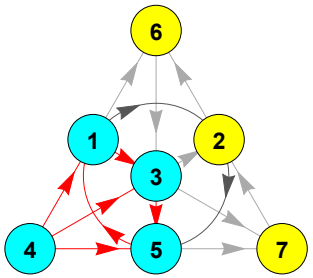
split=6
Fano plane



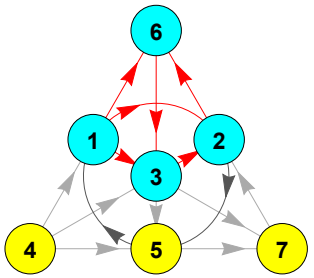
split=3
Fano plane



split=5
Fano plane



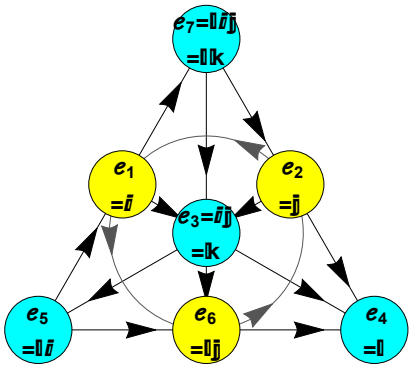
split=7
Fano plane



flip=True

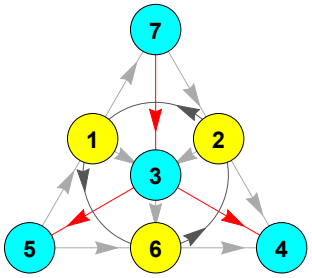
{1, 6, 2}{1, 3, 4}{1, 7, 5}{2, 3, 5}{2, 4, 7}{3, 6, 7}{4, 5, 6}

Fano plane



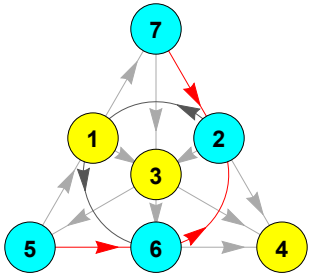
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	e_4	$-e_3$	$-e_7$	e_2	e_5
e_2	e_6	−1	e_5	e_7	$-e_3$	$-e_1$	$-e_4$
e_3	$-e_4$	$-e_5$	−1	e_1	e_2	e_7	$-e_6$
e_4	e_3	$-e_7$	$-e_1$	−1	e_6	$-e_5$	e_2
e_5	e_7	e_3	$-e_2$	$-e_6$	−1	e_4	$-e_1$
e_6	$-e_2$	e_1	$-e_7$	e_5	$-e_4$	−1	e_3
e_7	$-e_5$	e_4	e_6	$-e_2$	e_1	$-e_3$	−1

split=1
Fano plane

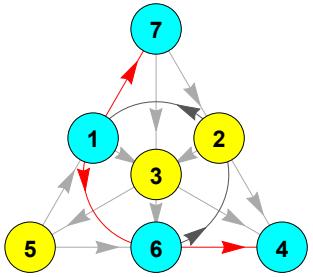


0↦1	1	2	3	4	5	6	7
1	−1	−6	4	−3	−7	2	5
2	6	−1	5	7	−3	−1	−4
3	−4	−5	1	−1	−2	7	6
4	3	−7	1	1	−6	−5	−2
5	7	3	2	6	1	4	1
6	−2	1	−7	5	−4	−1	3
7	−5	4	−6	2	−1	−3	1

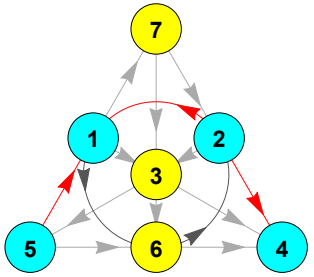
split=2
Fano plane



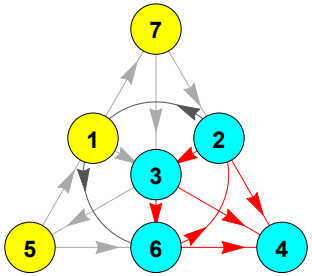
split=4
Fano plane



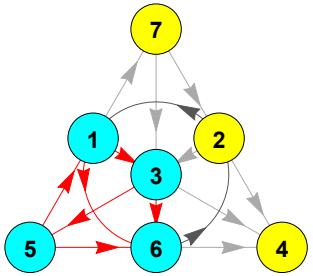
split=6
Fano plane



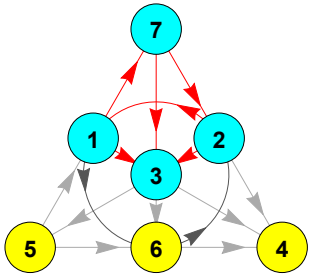
split=3
Fano plane



split=5
Fano plane



split=7
Fano plane

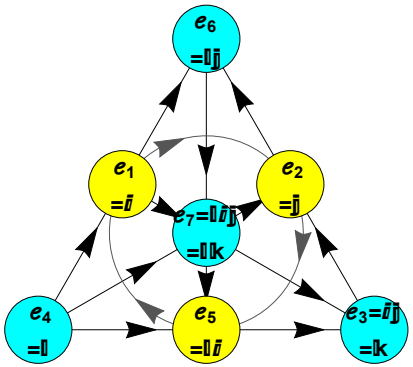


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
67	$c_{g_d}^{0\to -1/3}$		0apggsscc 0011000010_2	Bn{ E8{	0 0	1 0	0 −1	1 0	0 0	0 0	0 −1	1 0	} }	$\overline{Co}$ 27

flip=False

{1, 2, 5}{1, 7, 3}{1, 6, 4}{2, 6, 3}{2, 4, 7}{3, 4, 5}{5, 6, 7}

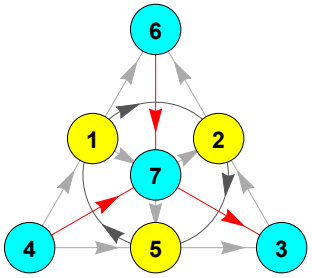
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	$-e_7$	$-e_6$	$-e_2$	e_4	e_3
e_2	$-e_5$	−1	$-e_6$	e_7	e_1	e_3	$-e_4$
e_3	e_7	e_6	−1	e_5	$-e_4$	$-e_2$	$-e_1$
e_4	e_6	$-e_7$	$-e_5$	−1	e_3	$-e_1$	e_2
e_5	e_2	$-e_1$	e_4	$-e_3$	−1	e_7	$-e_6$
e_6	$-e_4$	$-e_3$	e_2	e_1	$-e_7$	−1	e_5
e_7	$-e_3$	e_4	e_1	$-e_2$	e_6	$-e_5$	−1

split=1

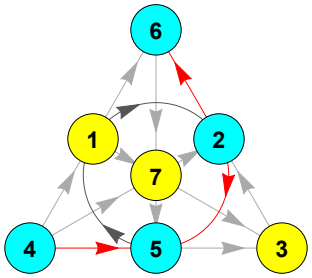
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−7	−6	−2	4	3
2	−5	−1	−6	7	1	3	−4
3	7	6	1	−5	−4	2	1
4	6	−7	5	1	3	1	−2
5	2	−1	4	−3	−1	7	−6
6	−4	−3	−2	−1	−7	1	−5
7	−3	4	−1	2	6	5	1

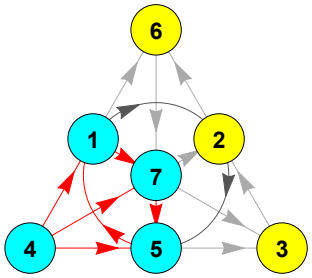
split=2

Fano plane



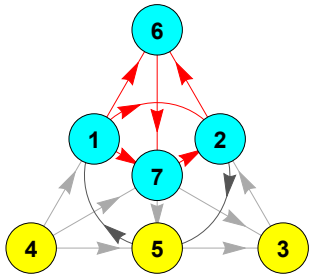
split=4

Fano plane



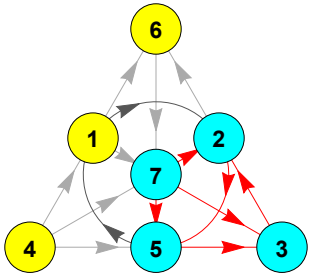
split=6

Fano plane



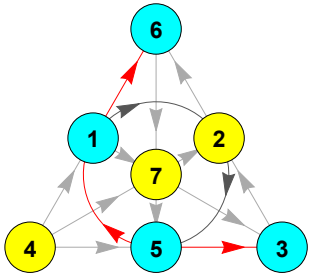
split=3

Fano plane



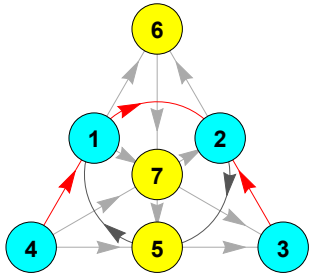
split=5

Fano plane



split=7

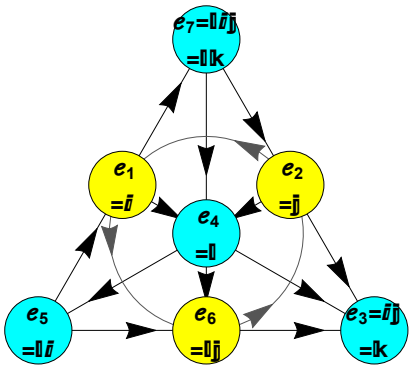
Fano plane



flip=True

{1, 6, 2}{1, 4, 3}{1, 7, 5}{2, 3, 7}{2, 4, 5}{3, 5, 6}{4, 6, 7}

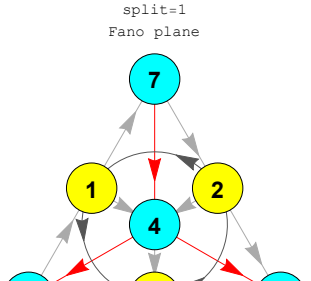
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_4$	e_3	$-e_7$	e_2	e_5
e_2	e_6	−1	e_7	e_5	$-e_4$	$-e_1$	$-e_3$
e_3	e_4	$-e_7$	−1	$-e_1$	e_6	$-e_5$	e_2
e_4	$-e_3$	$-e_5$	e_1	−1	e_2	e_7	$-e_6$
e_5	e_7	e_4	$-e_6$	$-e_2$	−1	e_3	$-e_1$
e_6	$-e_2$	e_1	e_5	$-e_7$	$-e_3$	−1	e_4
e_7	$-e_5$	e_3	$-e_2$	e_6	e_1	$-e_4$	−1

split=1

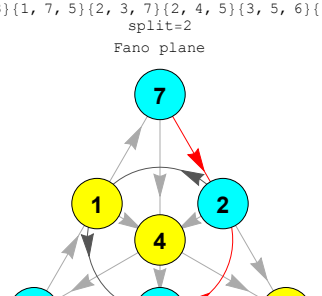
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−4	3	−7	2	5
2	6	−1	7	5	−4	−1	−3
3	4	−7	1	1	−6	−5	−2
4	−3	−5	−1	1	−2	7	6
5	7	4	6	2	1	3	1
6	−2	1	5	−7	−3	−1	4
7	−5	3	2	−6	−1	−4	1

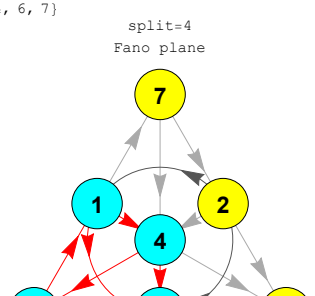
split=2

Fano plane



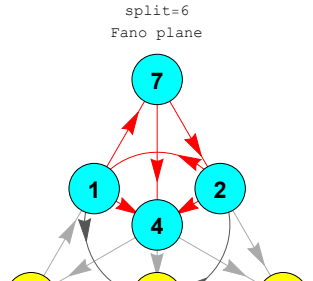
split=4

Fano plane



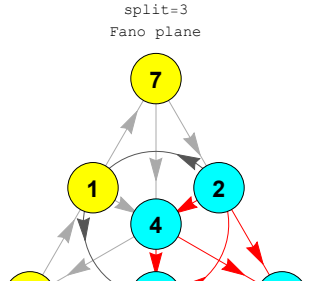
split=6

Fano plane



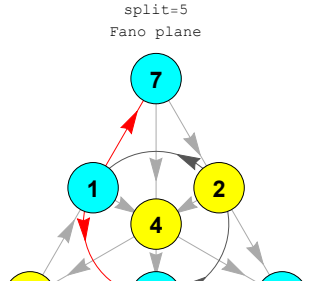
split=3

Fano plane



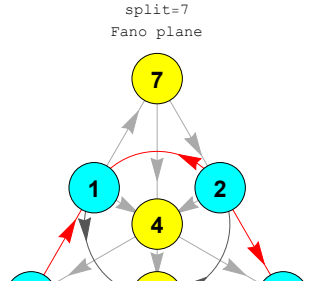
split=5

Fano plane



split=7

Fano plane

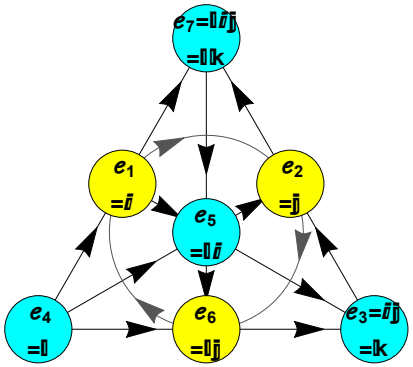


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
68	$C_{b_d}^{2/3\to-1/3}$		0apggsscc 001100011_2	Bn{ E8{	0 0	1 0	0 -1	0 0	1 0	1 0	0 0	0 -1	} }	Rf 104

flip=False

{1, 2, 6}{1, 5, 3}{1, 7, 4}{2, 7, 3}{2, 4, 5}{3, 4, 6}{5, 6, 7}

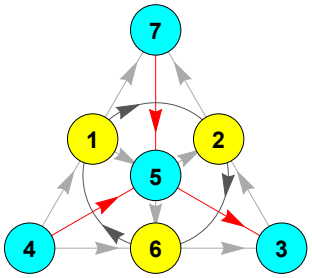
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_5$	$-e_7$	e_3	$-e_2$	e_4
e_2	$-e_6$	-1	$-e_7$	e_5	$-e_4$	e_1	e_3
e_3	e_5	e_7	-1	e_6	$-e_1$	$-e_4$	$-e_2$
e_4	e_7	$-e_5$	$-e_6$	-1	e_2	e_3	$-e_1$
e_5	$-e_3$	e_4	e_1	$-e_2$	-1	e_7	$-e_6$
e_6	e_2	$-e_1$	e_4	$-e_3$	$-e_7$	-1	e_5
e_7	$-e_4$	$-e_3$	e_2	e_1	e_6	$-e_5$	-1

split=1

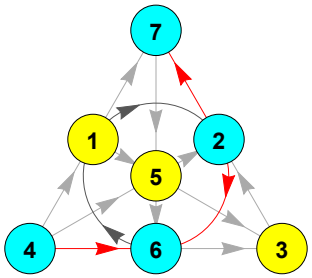
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	-5	-7	3	-2	4
2	-6	-1	-7	5	-4	1	3
3	5	7	1	-6	1	-4	2
4	7	-5	6	1	-2	3	1
5	-3	4	-1	2	1	7	6
6	2	-1	4	-3	-7	-1	5
7	-4	-3	-2	-1	-6	-5	1

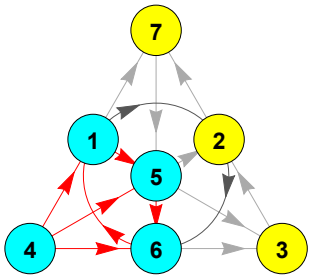
split=2

Fano plane



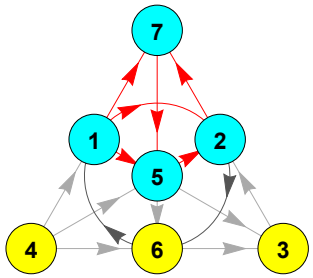
split=4

Fano plane



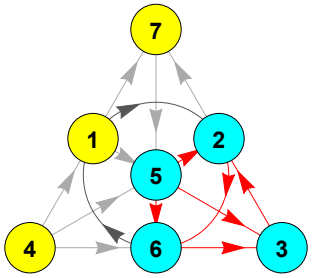
split=6

Fano plane



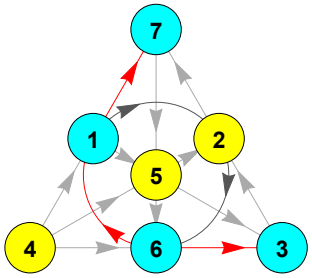
split=3

Fano plane



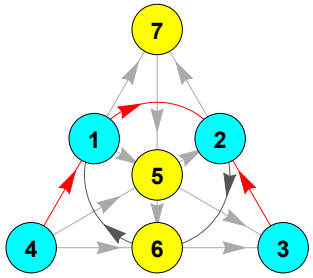
split=5

Fano plane



split=7

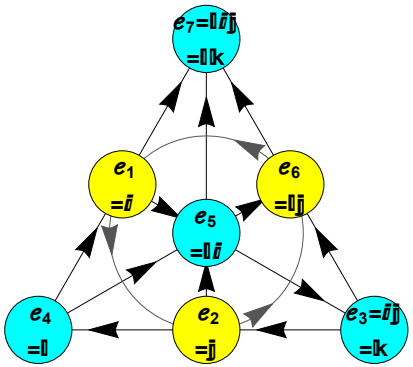
Fano plane



flip=True

{1, 2, 6}{1, 5, 3}{1, 7, 4}{2, 4, 3}{2, 5, 7}{3, 6, 7}{4, 5, 6}

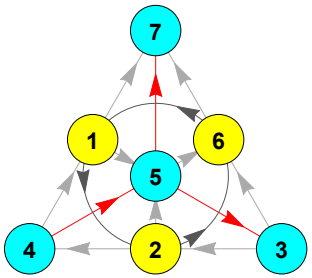
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_5$	$-e_7$	e_3	$-e_2$	e_4
e_2	$-e_6$	-1	$-e_4$	e_3	e_7	e_1	$-e_5$
e_3	e_5	e_4	-1	$-e_2$	$-e_1$	e_7	$-e_6$
e_4	e_7	$-e_3$	e_2	-1	e_6	$-e_5$	$-e_1$
e_5	$-e_3$	$-e_7$	e_1	$-e_6$	-1	e_4	e_2
e_6	e_2	$-e_1$	$-e_7$	e_5	$-e_4$	-1	e_3
e_7	$-e_4$	e_5	e_6	e_1	$-e_2$	$-e_3$	-1

split=1

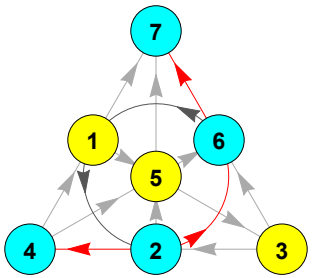
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	-5	-7	3	-2	4
2	-6	-1	-4	3	7	1	-5
3	5	4	1	2	1	7	6
4	7	-3	-2	1	-6	-5	1
5	-3	-7	-1	6	1	4	-2
6	2	-1	-7	5	-4	-1	3
7	-4	5	-6	-1	2	-3	1

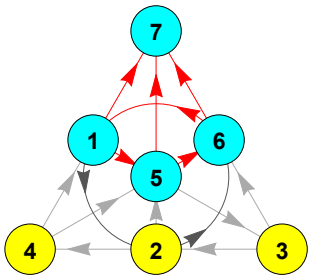
split=2

Fano plane



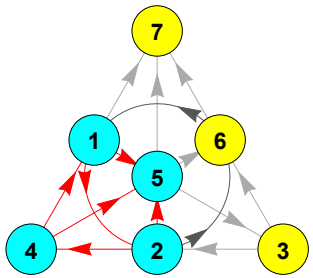
split=4

Fano plane



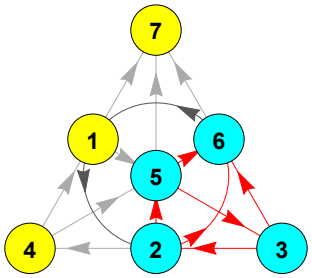
split=6

Fano plane



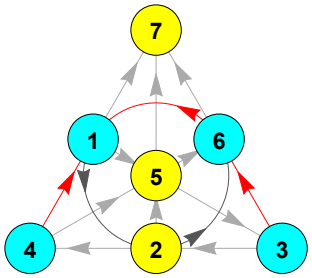
split=3

Fano plane



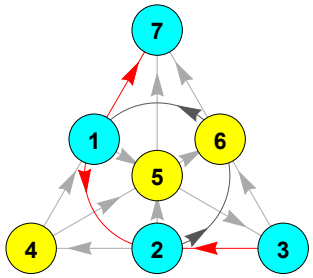
split=5

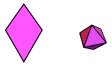
Fano plane



split=7

Fano plane

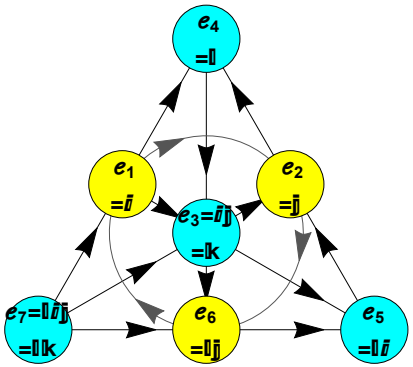


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
69	$\overline{s}_{m_1}^{1/3}$		0apggsscc 0101001111_2	Bn{ E8{	0 0	1 0	0 -1	0 0	1 0	0 0	1 0	0 1	} }	$\overline{\text{Uuo}}$ 118

flip=False

{1, 2, 6}{1, 3, 5}{1, 4, 7}{2, 7, 3}{2, 4, 5}{3, 6, 4}{5, 7, 6}

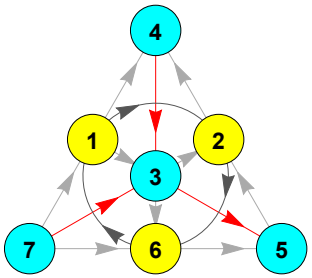
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	e_5	e_7	$-e_3$	$-e_2$	$-e_4$
e_2	$-e_6$	-1	$-e_7$	e_5	$-e_4$	e_1	e_3
e_3	$-e_5$	e_7	-1	$-e_6$	e_1	e_4	$-e_2$
e_4	$-e_7$	$-e_5$	e_6	-1	e_2	$-e_3$	e_1
e_5	e_3	e_4	$-e_1$	$-e_2$	-1	$-e_7$	e_6
e_6	e_2	$-e_1$	$-e_4$	e_3	e_7	-1	$-e_5$
e_7	e_4	$-e_3$	e_2	$-e_1$	$-e_6$	e_5	-1

split=1

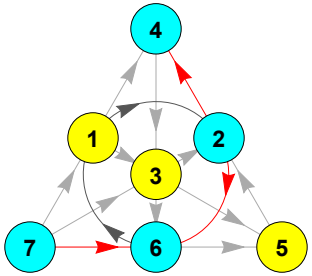
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	5	7	-3	-2	-4
2	-6	-1	-7	5	-4	1	3
3	-5	7	1	6	-1	4	2
4	-7	-5	-6	1	-2	-3	-1
5	3	4	1	2	1	-7	-6
6	2	-1	-4	3	7	-1	-5
7	4	-3	-2	1	6	5	1

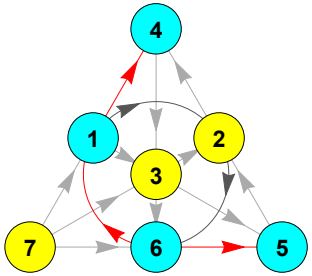
split=2

Fano plane



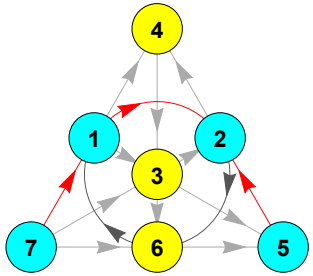
split=4

Fano plane



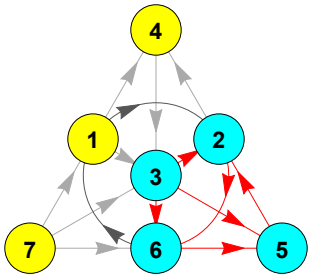
split=6

Fano plane



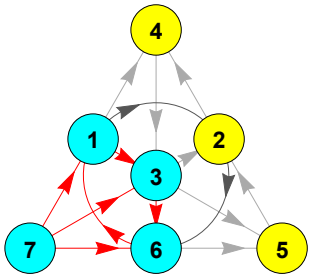
split=3

Fano plane



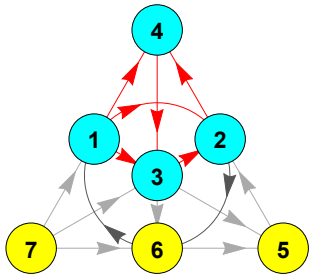
split=5

Fano plane



split=7

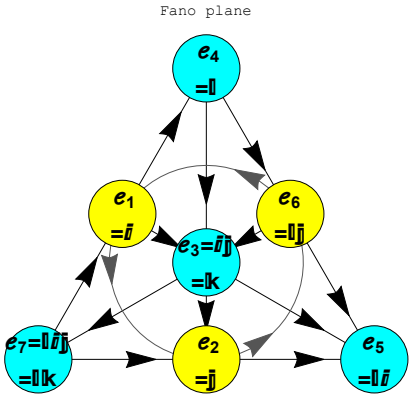
Fano plane



flip=True

{1, 2, 6}{1, 3, 5}{1, 4, 7}{2, 4, 3}{2, 5, 7}{3, 7, 6}{4, 6, 5}

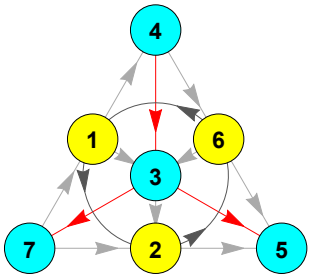
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	e_5	e_7	$-e_3$	$-e_2$	$-e_4$
e_2	$-e_6$	-1	$-e_4$	e_3	e_7	e_1	$-e_5$
e_3	$-e_5$	e_4	-1	$-e_2$	e_1	$-e_7$	e_6
e_4	$-e_7$	$-e_3$	e_2	-1	$-e_6$	e_5	e_1
e_5	e_3	$-e_7$	$-e_1$	e_6	-1	$-e_4$	e_2
e_6	e_2	$-e_1$	e_7	$-e_5$	e_4	-1	$-e_3$
e_7	e_4	e_5	$-e_6$	$-e_1$	$-e_2$	e_3	-1

split=1

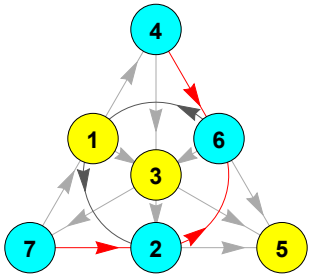
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	5	7	-3	-2	-4
2	-6	-1	-4	3	7	1	-5
3	-5	4	1	2	-1	-7	-6
4	-7	-3	-2	1	6	5	-1
5	3	-7	1	-6	1	-4	-2
6	2	-1	7	-5	4	-1	-3
7	4	5	6	1	2	3	1

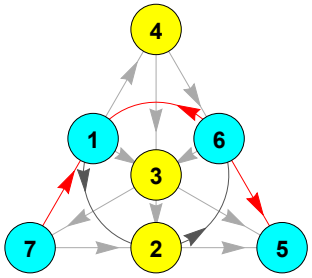
split=2

Fano plane



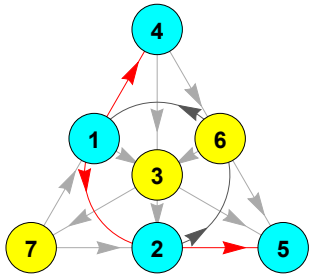
split=4

Fano plane



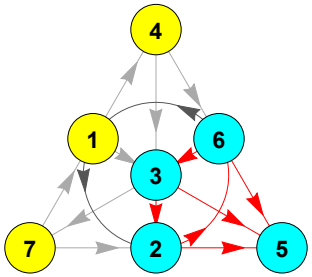
split=6

Fano plane



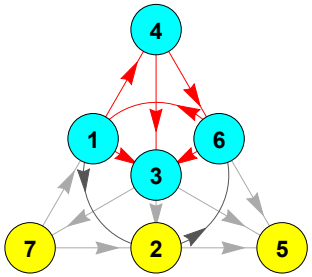
split=3

Fano plane



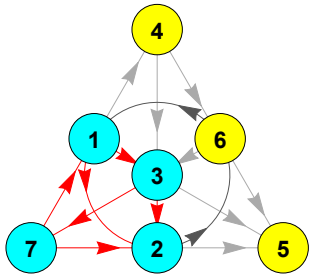
split=5

Fano plane



split=7

Fano plane

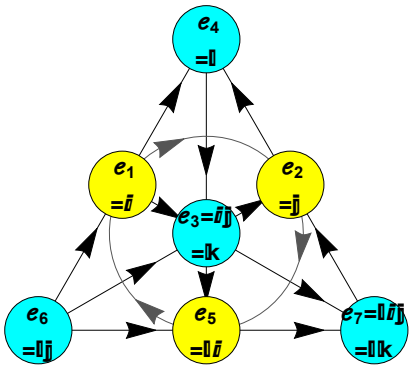


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
70	$\overline{S}_{c_1}^{\overline{R}\mapsto 1/3}$		0apggsscc 010100110_2	Bn{ E8{	0 0	1 0	0 −1	0 0	1 0	0 0	0 1	1 0	} }	$\overline{Fe}$ 26

flip=False

{1, 2, 5}{1, 3, 7}{1, 4, 6}{2, 6, 3}{2, 4, 7}{3, 5, 4}{5, 7, 6}

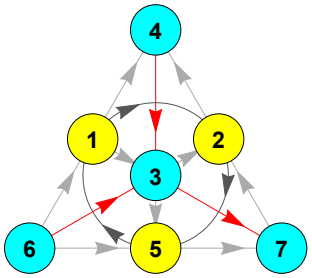
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_7	e_6	$-e_2$	$-e_4$	$-e_3$
e_2	$-e_5$	−1	$-e_6$	e_7	e_1	e_3	$-e_4$
e_3	$-e_7$	e_6	−1	$-e_5$	e_4	$-e_2$	e_1
e_4	$-e_6$	$-e_7$	e_5	−1	$-e_3$	e_1	e_2
e_5	e_2	$-e_1$	$-e_4$	e_3	−1	$-e_7$	e_6
e_6	e_4	$-e_3$	e_2	$-e_1$	e_7	−1	$-e_5$
e_7	e_3	e_4	$-e_1$	$-e_2$	$-e_6$	e_5	−1

split=1

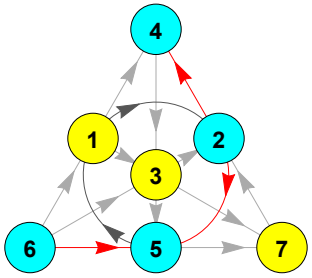
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	7	6	−2	−4	−3
2	−5	−1	−6	7	1	3	−4
3	−7	6	1	5	4	2	−1
4	−6	−7	−5	1	−3	−1	−2
5	2	−1	−4	3	−1	−7	6
6	4	−3	−2	1	7	1	5
7	3	4	1	2	−6	−5	1

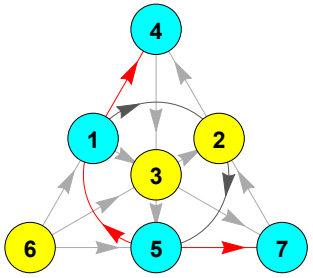
split=2

Fano plane



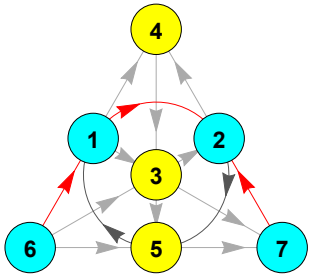
split=4

Fano plane



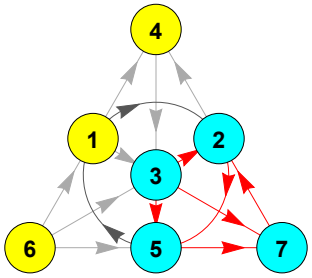
split=6

Fano plane



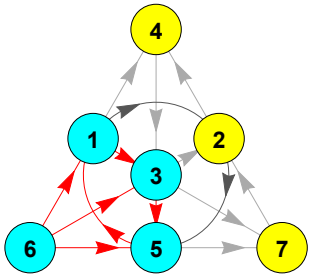
split=3

Fano plane



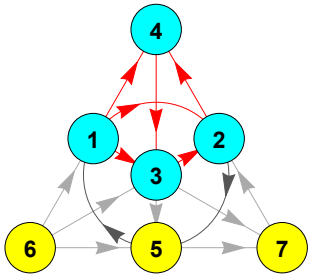
split=5

Fano plane



split=7

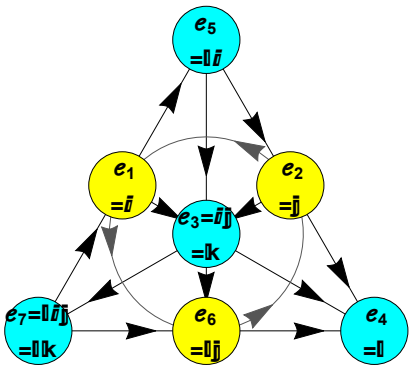
Fano plane



flip=True

{1, 6, 2}{1, 3, 4}{1, 5, 7}{2, 3, 7}{2, 4, 5}{3, 6, 5}{4, 7, 6}

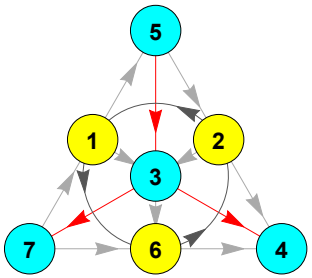
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	e_4	$-e_3$	e_7	e_2	$-e_5$
e_2	e_6	−1	e_7	e_5	$-e_4$	$-e_1$	$-e_3$
e_3	$-e_4$	$-e_7$	−1	e_1	$-e_6$	e_5	e_2
e_4	e_3	$-e_5$	$-e_1$	−1	e_2	$-e_7$	e_6
e_5	$-e_7$	e_4	e_6	$-e_2$	−1	$-e_3$	e_1
e_6	$-e_2$	e_1	$-e_5$	e_7	e_3	−1	$-e_4$
e_7	e_5	e_3	$-e_2$	$-e_6$	$-e_1$	e_4	−1

split=1

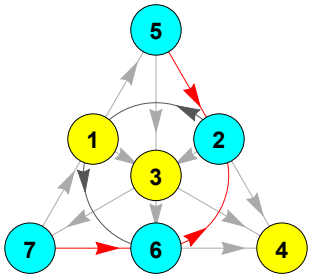
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	4	−3	7	2	−5
2	6	−1	7	5	−4	−1	−3
3	−4	−7	1	−1	6	5	−2
4	3	−5	1	1	−2	−7	−6
5	−7	4	−6	2	1	−3	−1
6	−2	1	−5	7	3	−1	−4
7	5	3	2	6	1	4	1

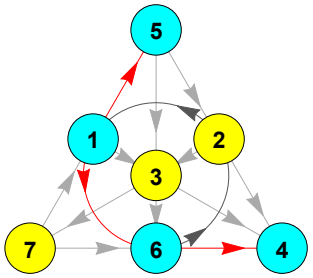
split=2

Fano plane



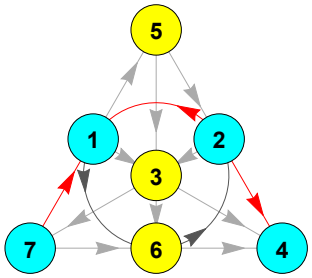
split=4

Fano plane



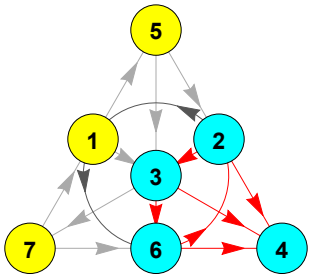
split=6

Fano plane



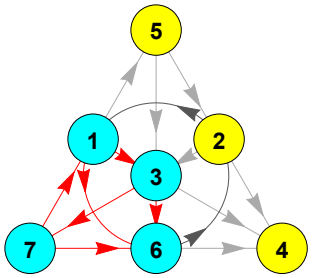
split=3

Fano plane



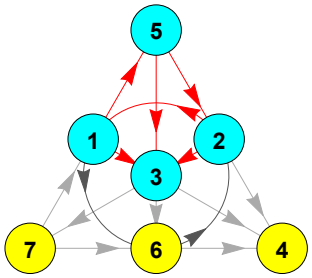
split=5

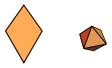
Fano plane



split=7

Fano plane

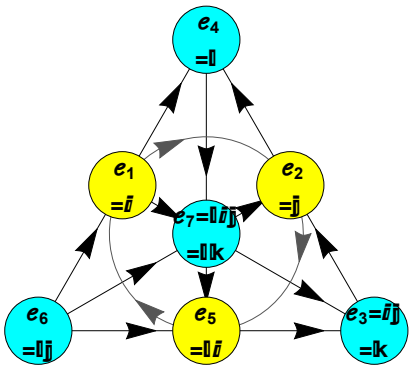


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
71	$\overline{S}_{\circ_1}^{\;\mapsto 1/3}$		0apggsscc 010100101_2	Bn{ E8{	0 0	1 0	0 −1	0 0	0 0	1 1	1 0	0 0	} }	$\overline{Ca}$ 20

flip=False

{1, 2, 5}{1, 7, 3}{1, 4, 6}{2, 4, 3}{2, 6, 7}{3, 6, 5}{4, 7, 5}

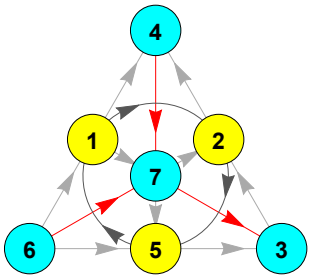
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	$-e_7$	e_6	$-e_2$	$-e_4$	e_3
e_2	e_2	$-e_5$	−1	$-e_4$	e_3	e_1	e_7	$-e_6$
e_3	e_3	e_7	e_4	−1	$-e_2$	e_6	e_5	$-e_1$
e_4	e_4	$-e_6$	e_3	e_2	−1	$-e_7$	e_1	e_5
e_5	e_5	e_2	$-e_1$	e_6	e_7	−1	$-e_3$	$-e_4$
e_6	e_6	e_4	$-e_7$	$-e_5$	$-e_1$	e_3	−1	e_2
e_7	e_7	$-e_3$	e_6	e_1	$-e_5$	e_4	$-e_2$	−1

split=1

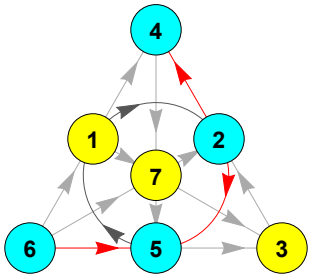
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−7	6	−2	−4	3
2	−5	−1	−4	3	1	7	−6
3	7	4	1	2	−6	−5	1
4	−6	−3	−2	1	−7	−1	−5
5	2	−1	6	7	−1	−3	−4
6	4	−7	5	1	3	1	−2
7	−3	6	−1	5	4	2	1

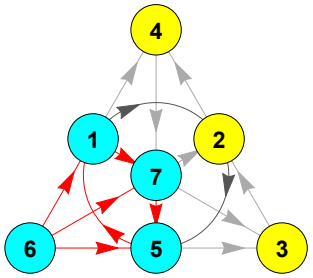
split=2

Fano plane



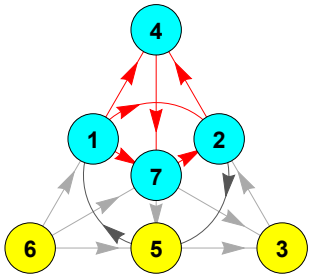
split=4

Fano plane



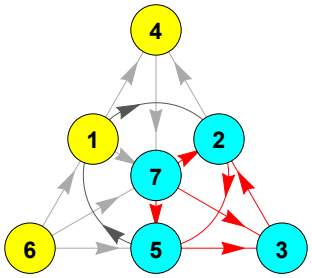
split=6

Fano plane



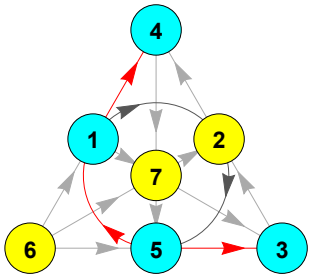
split=3

Fano plane



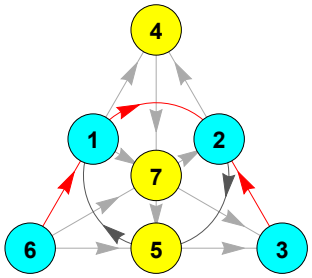
split=5

Fano plane



split=7

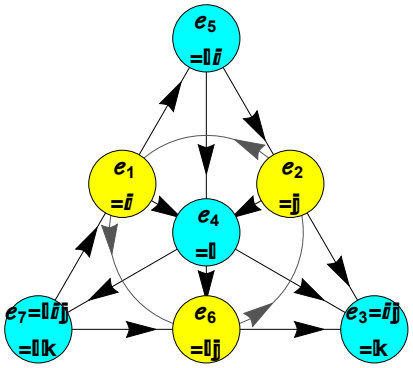
Fano plane



flip=True

{1, 6, 2}{1, 4, 3}{1, 5, 7}{2, 3, 5}{2, 4, 7}{3, 7, 6}{4, 6, 5}

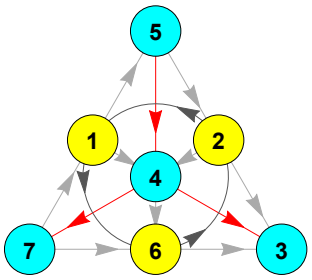
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	$-e_4$	e_3	e_7	e_2	$-e_5$
e_2	e_2	e_6	−1	e_5	e_7	$-e_3$	$-e_1$	$-e_4$
e_3	e_3	e_4	$-e_5$	−1	$-e_1$	e_2	$-e_7$	e_6
e_4	e_4	$-e_3$	$-e_7$	e_1	−1	$-e_6$	e_5	e_2
e_5	e_5	$-e_7$	e_3	$-e_2$	e_6	−1	$-e_4$	e_1
e_6	e_6	$-e_2$	e_1	e_7	$-e_5$	e_4	−1	$-e_3$
e_7	e_7	e_5	e_4	$-e_6$	$-e_2$	$-e_1$	e_3	−1

split=1

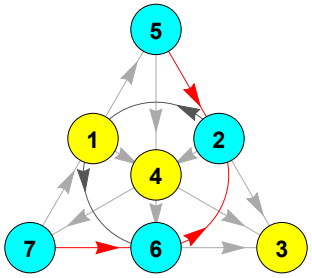
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−4	3	7	2	−5
2	6	−1	5	7	−3	−1	−4
3	4	−5	1	1	−2	−7	−6
4	−3	−7	−1	1	6	5	−2
5	−7	3	2	−6	1	−4	−1
6	−2	1	7	−5	4	−1	−3
7	5	4	6	2	1	3	1

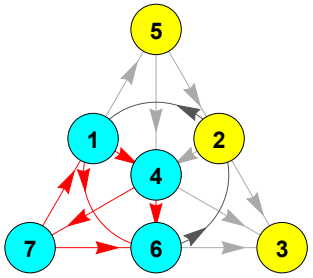
split=2

Fano plane



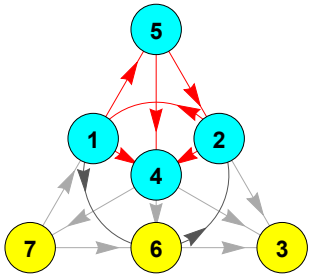
split=4

Fano plane



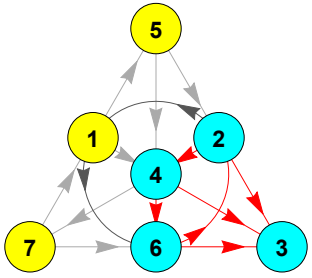
split=6

Fano plane



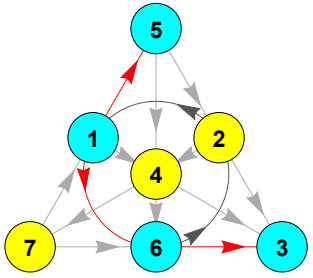
split=3

Fano plane



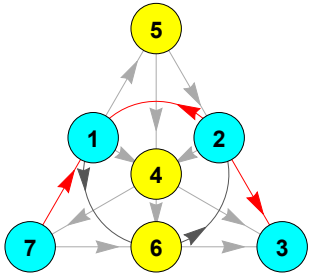
split=5

Fano plane



split=7

Fano plane

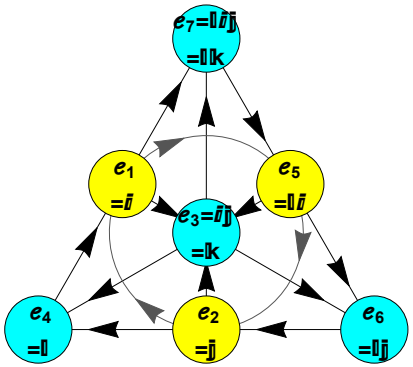


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
72	ν_μ w_d		0apggsscc 001100000_2	Bn{ E8{	0 0	1 0	0 −1	0 0	0 1	1 0	0 0	1 0	} }	$\overline{\text{Al}}$ 13

flip=False

{1, 5, 2}{1, 3, 6}{1, 7, 4}{2, 3, 7}{2, 4, 6}{3, 4, 5}{5, 6, 7}

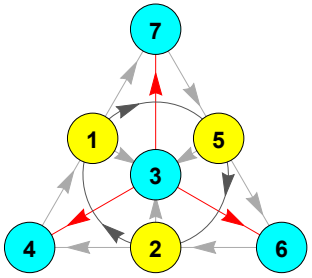
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_6	$-e_7$	e_2	$-e_3$	e_4
e_2	e_5	−1	e_7	e_6	$-e_1$	$-e_4$	$-e_3$
e_3	$-e_6$	$-e_7$	−1	e_5	$-e_4$	e_1	e_2
e_4	e_7	$-e_6$	$-e_5$	−1	e_3	e_2	$-e_1$
e_5	$-e_2$	e_1	e_4	$-e_3$	−1	e_7	$-e_6$
e_6	e_3	e_4	$-e_1$	$-e_2$	$-e_7$	−1	e_5
e_7	$-e_4$	e_3	$-e_2$	e_1	e_6	$-e_5$	−1

split=1

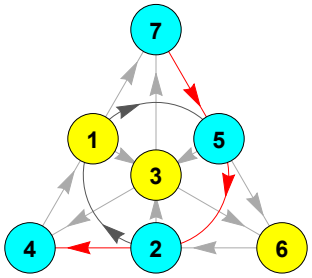
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	6	−7	2	−3	4
2	5	−1	7	6	−1	−4	−3
3	−6	−7	1	−5	−4	−1	−2
4	7	−6	5	1	3	−2	1
5	−2	1	4	−3	−1	7	−6
6	3	4	1	2	−7	1	−5
7	−4	3	2	−1	6	5	1

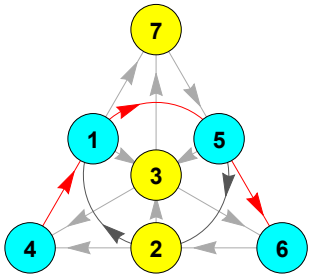
split=2

Fano plane



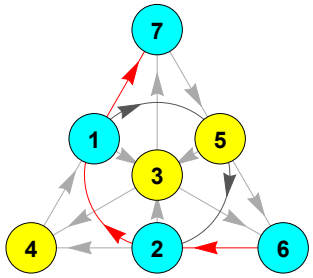
split=4

Fano plane



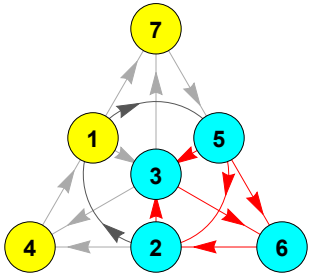
split=6

Fano plane



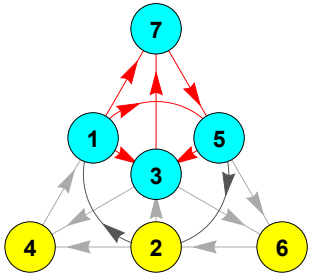
split=3

Fano plane



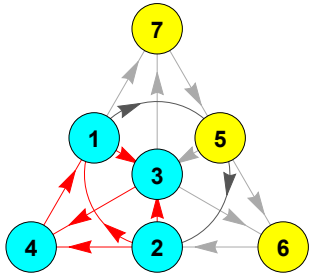
split=5

Fano plane



split=7

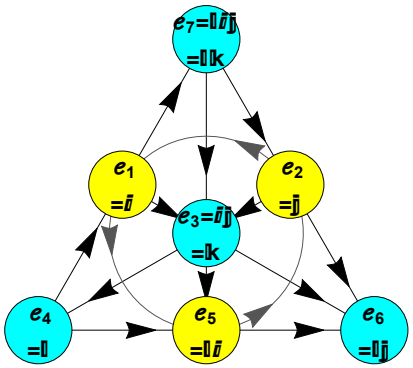
Fano plane



flip=True

{1, 5, 2}{1, 3, 6}{1, 7, 4}{2, 3, 4}{2, 6, 7}{3, 5, 7}{4, 5, 6}

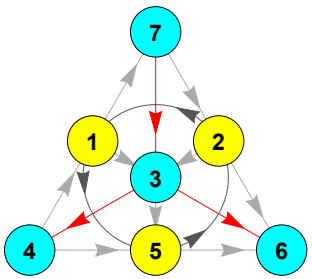
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_6	$-e_7$	e_2	$-e_3$	e_4
e_2	e_5	−1	e_4	$-e_3$	$-e_1$	e_7	$-e_6$
e_3	$-e_6$	$-e_4$	−1	e_2	e_7	e_1	$-e_5$
e_4	e_7	e_3	$-e_2$	−1	e_6	$-e_5$	$-e_1$
e_5	$-e_2$	e_1	$-e_7$	$-e_6$	−1	e_4	e_3
e_6	e_3	$-e_7$	$-e_1$	e_5	$-e_4$	−1	e_2
e_7	$-e_4$	e_6	e_5	e_1	$-e_3$	$-e_2$	−1

split=1

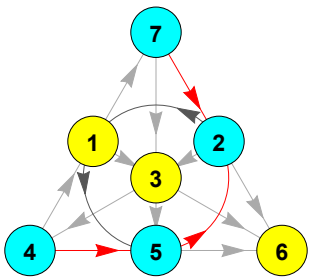
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	6	−7	2	−3	4
2	5	−1	4	−3	−1	7	−6
3	−6	−4	1	−2	7	−1	5
4	7	3	2	1	6	5	1
5	−2	1	−7	−6	−1	4	3
6	3	−7	1	−5	−4	1	−2
7	−4	6	−5	−1	−3	2	1

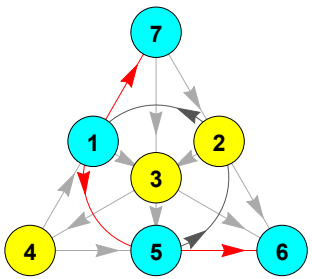
split=2

Fano plane



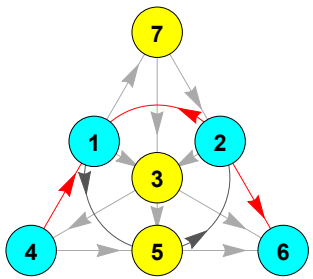
split=4

Fano plane



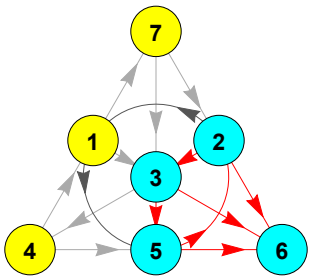
split=6

Fano plane



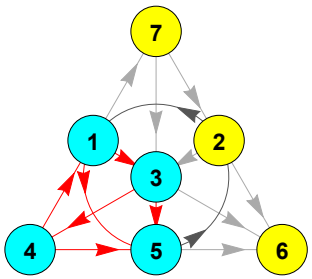
split=3

Fano plane



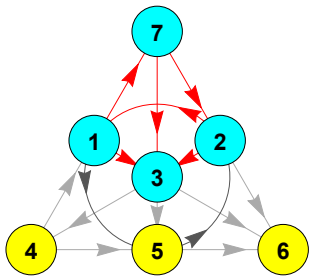
split=5

Fano plane



split=7

Fano plane

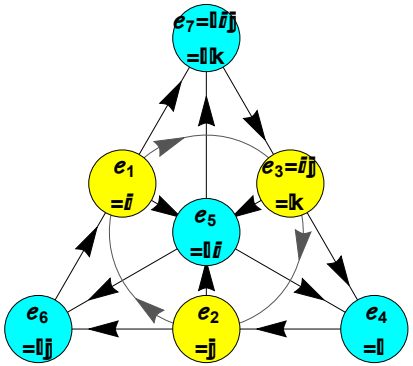


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
73	$e_{\tau\phi}{}_{r_d}^{0\to-1}{}_{L}$		0apggsscc 001000001_2	Bn{ E8{	0 0	1 0	0 −1	0 1	0 0	0 0	1 0	1 0	} }	$\bar{C}$ 6

flip=False

{1, 3, 2}{1, 5, 4}{1, 7, 6}{2, 6, 4}{2, 5, 7}{3, 4, 7}{3, 5, 6}

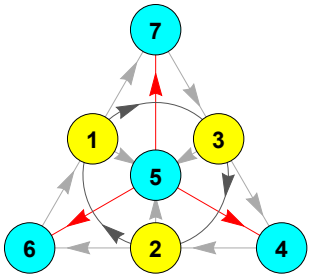
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	e_5	$-e_4$	e_7	$-e_6$
e_2	e_2	$-e_3$	−1	e_1	e_6	$-e_7$	$-e_4$	e_5
e_3	e_3	e_2	$-e_1$	−1	e_7	e_6	$-e_5$	$-e_4$
e_4	e_4	$-e_5$	$-e_6$	$-e_7$	−1	e_1	e_2	e_3
e_5	e_5	e_4	$-e_7$	e_6	$-e_1$	−1	$-e_3$	e_2
e_6	e_6	e_7	e_4	$-e_5$	$-e_2$	e_3	−1	$-e_1$
e_7	e_7	$-e_6$	e_5	e_4	$-e_3$	$-e_2$	e_1	−1

split=1

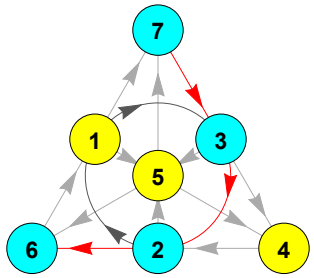
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−5	4	−7	6
2	3	−1	−1	−6	7	4	−5
3	−2	1	−1	7	6	−5	−4
4	5	6	−7	1	1	2	−3
5	−4	−7	−6	−1	1	−3	−2
6	7	−4	5	−2	3	1	1
7	−6	5	4	3	2	−1	1

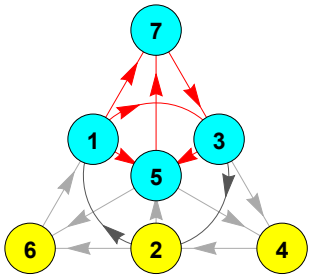
split=2

Fano plane



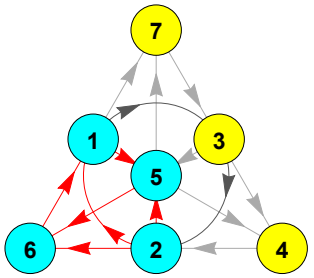
split=4

Fano plane



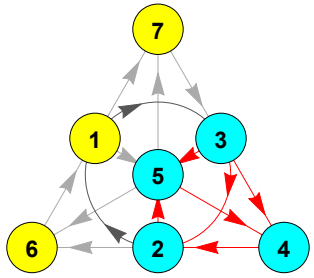
split=6

Fano plane



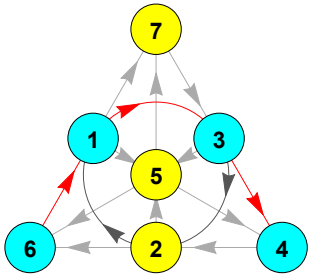
split=3

Fano plane



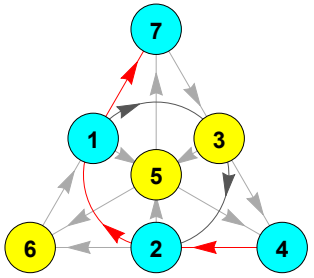
split=5

Fano plane



split=7

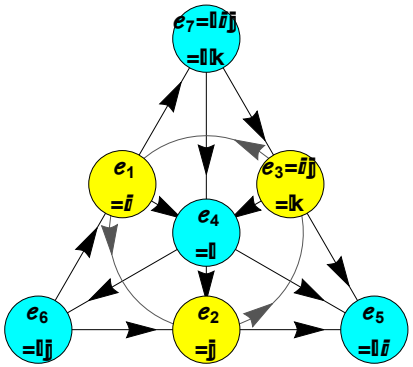
Fano plane



flip=True

{1, 2, 3}{1, 4, 5}{1, 7, 6}{2, 7, 4}{2, 5, 6}{3, 4, 6}{3, 5, 7}

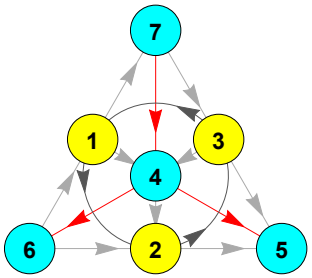
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	e_5	$-e_4$	e_7	e_6
e_2	e_2	$-e_3$	−1	e_1	$-e_7$	e_6	$-e_5$	e_4
e_3	e_3	e_2	$-e_1$	−1	e_6	e_7	$-e_4$	$-e_5$
e_4	e_4	$-e_5$	e_7	$-e_6$	−1	e_1	e_3	$-e_2$
e_5	e_5	e_4	$-e_6$	$-e_7$	$-e_1$	−1	e_2	e_3
e_6	e_6	e_7	e_5	e_4	$-e_3$	$-e_2$	−1	$-e_1$
e_7	e_7	$-e_6$	$-e_4$	e_5	e_2	$-e_3$	e_1	−1

split=1

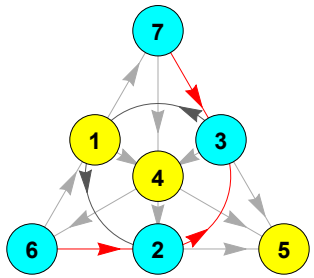
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	5	−4	−7	6
2	−3	−1	1	−7	6	−5	4
3	2	−1	−1	6	7	−4	−5
4	−5	7	−6	1	−1	−3	2
5	4	−6	−7	1	1	−2	−3
6	7	5	4	3	2	1	1
7	−6	−4	5	−2	3	−1	1

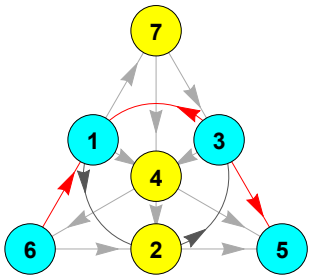
split=2

Fano plane



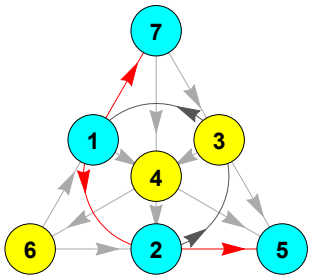
split=4

Fano plane



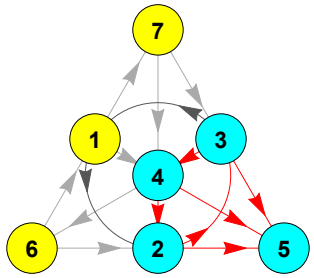
split=6

Fano plane



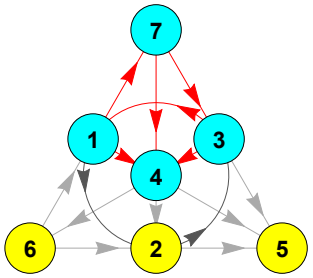
split=3

Fano plane



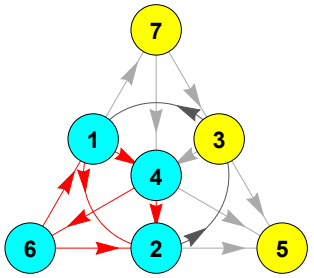
split=5

Fano plane



split=7

Fano plane

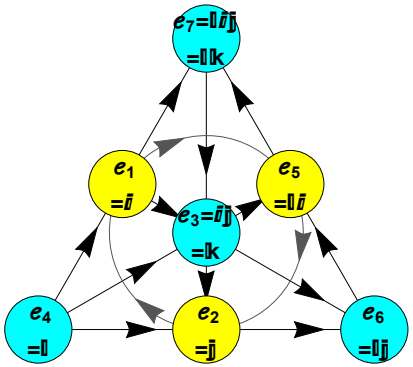


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
74	$\overline{\mu}_{y_d}^{\dagger}\,\nu_L$		0apggsscc 010100000_2	Bn{ E8{	0 0	0 0	1 0	1 −1	1 −1	0 0	0 0	0 0	} }	$\overline{Zn}$ 30

flip=False

{1, 5, 2}{1, 3, 6}{1, 7, 4}{2, 7, 3}{2, 6, 4}{3, 5, 4}{5, 7, 6}

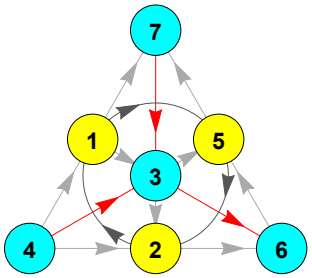
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_6	$-e_7$	e_2	$-e_3$	e_4
e_2	e_5	−1	$-e_7$	$-e_6$	$-e_1$	e_4	e_3
e_3	$-e_6$	e_7	−1	$-e_5$	e_4	e_1	$-e_2$
e_4	e_7	e_6	e_5	−1	$-e_3$	$-e_2$	$-e_1$
e_5	$-e_2$	e_1	$-e_4$	e_3	−1	$-e_7$	e_6
e_6	e_3	$-e_4$	$-e_1$	e_2	e_7	−1	$-e_5$
e_7	$-e_4$	$-e_3$	e_2	e_1	$-e_6$	e_5	−1

split=1

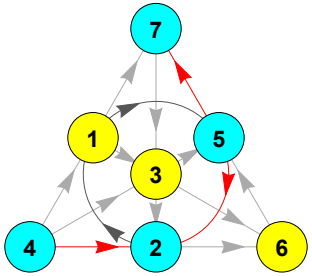
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	6	−7	2	−3	4
2	5	−1	−7	−6	−1	4	3
3	−6	7	1	5	4	−1	2
4	7	6	−5	1	−3	2	1
5	−2	1	−4	3	−1	−7	6
6	3	−4	1	−2	7	1	5
7	−4	−3	−2	−1	−6	−5	1

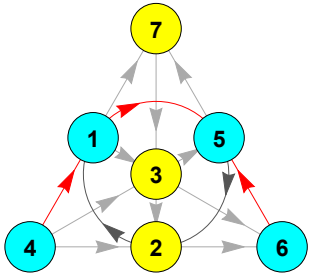
split=2

Fano plane



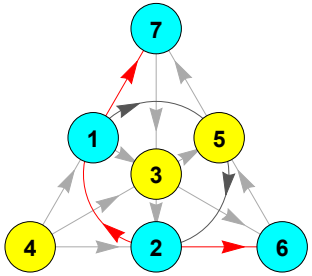
split=4

Fano plane



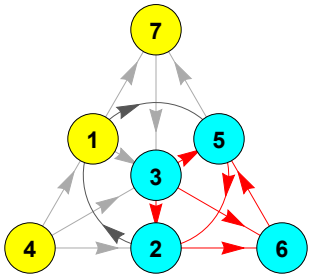
split=6

Fano plane



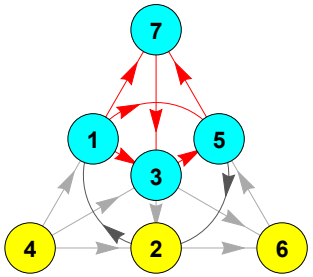
split=3

Fano plane



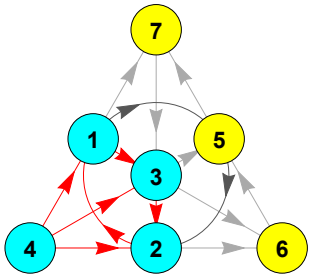
split=5

Fano plane



split=7

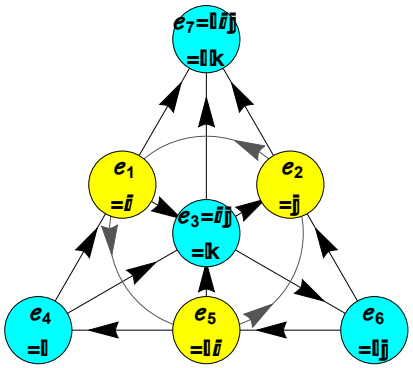
Fano plane



flip=True

{1, 5, 2}{1, 3, 6}{1, 7, 4}{2, 4, 3}{2, 7, 6}{3, 7, 5}{4, 6, 5}

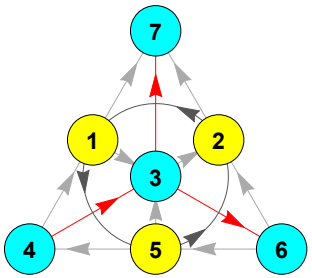
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_6	$-e_7$	e_2	$-e_3$	e_4
e_2	e_5	−1	$-e_4$	e_3	$-e_1$	$-e_7$	e_6
e_3	$-e_6$	e_4	−1	$-e_2$	$-e_7$	e_1	e_5
e_4	e_7	$-e_3$	e_2	−1	$-e_6$	e_5	$-e_1$
e_5	$-e_2$	e_1	e_7	e_6	−1	$-e_4$	$-e_3$
e_6	e_3	e_7	$-e_1$	$-e_5$	e_4	−1	$-e_2$
e_7	$-e_4$	$-e_6$	$-e_5$	e_1	e_3	e_2	−1

split=1

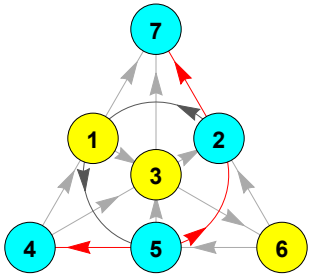
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	6	−7	2	−3	4
2	5	−1	−4	3	−1	−7	6
3	−6	4	1	2	−7	−1	−5
4	7	−3	−2	1	−6	−5	1
5	−2	1	7	6	−1	−4	−3
6	3	7	1	5	4	1	2
7	−4	−6	5	−1	3	−2	1

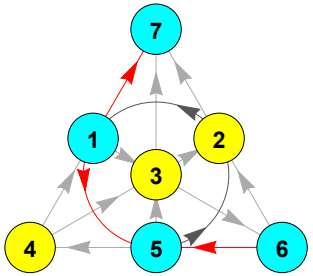
split=2

Fano plane



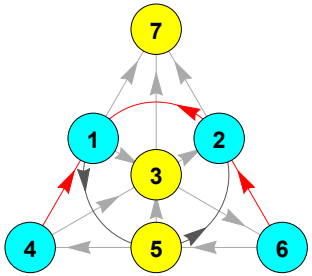
split=4

Fano plane



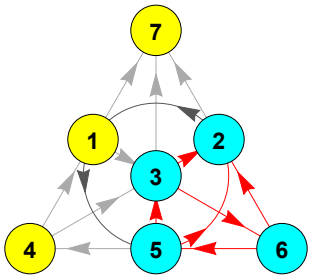
split=6

Fano plane



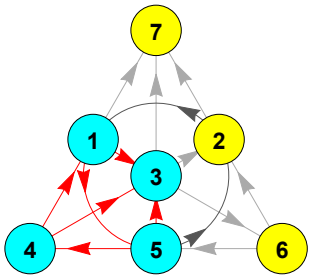
split=3

Fano plane



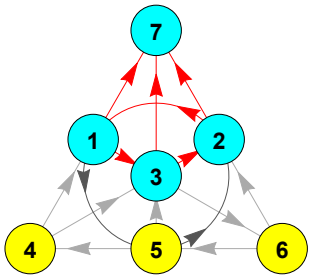
split=5

Fano plane



split=7

Fano plane

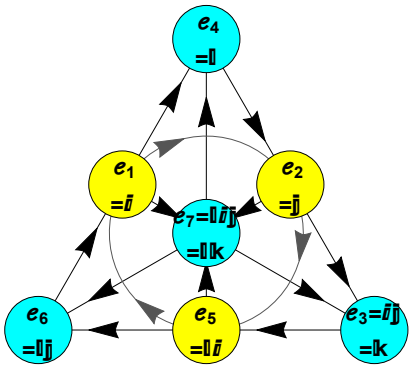


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
75	$c_{r_1}^{0\to 2/3}$		0apggsscc 001100101_2	Bn{ E8{	0 0	0 0	1 0	1 -1	0 0	1 -1	0 0	0 0	} }	$\overline{Cr}$ 24

flip=False

{1, 2, 5}{1, 7, 3}{1, 4, 6}{2, 3, 4}{2, 7, 6}{3, 5, 6}{4, 5, 7}

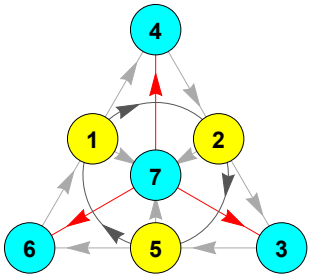
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	$-e_7$	e_6	$-e_2$	$-e_4$	e_3
e_2	$-e_5$	-1	e_4	$-e_3$	e_1	$-e_7$	e_6
e_3	e_7	$-e_4$	-1	e_2	e_6	$-e_5$	$-e_1$
e_4	$-e_6$	e_3	$-e_2$	-1	e_7	e_1	$-e_5$
e_5	e_2	$-e_1$	$-e_6$	$-e_7$	-1	e_3	e_4
e_6	e_4	e_7	e_5	$-e_1$	$-e_3$	-1	$-e_2$
e_7	$-e_3$	$-e_6$	e_1	e_5	$-e_4$	e_2	-1

split=1

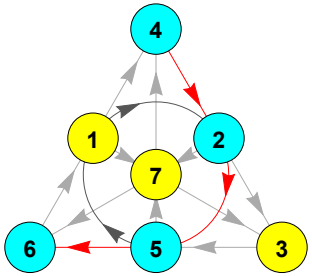
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	-7	6	-2	-4	3
2	-5	-1	4	-3	1	-7	6
3	7	-4	1	-2	6	5	1
4	-6	3	2	1	7	-1	5
5	2	-1	-6	-7	-1	3	4
6	4	7	-5	1	-3	1	2
7	-3	-6	-1	-5	-4	-2	1

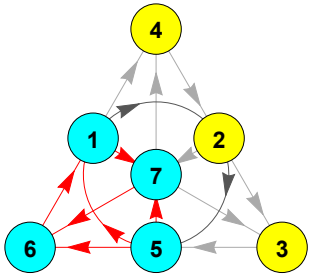
split=2

Fano plane



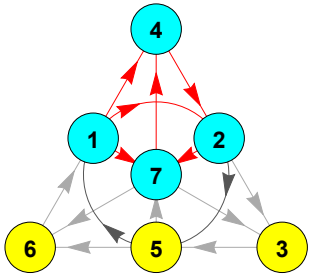
split=4

Fano plane



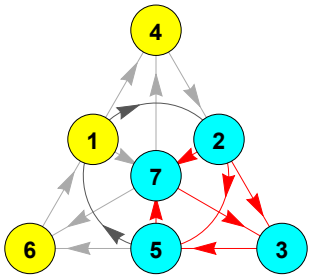
split=6

Fano plane



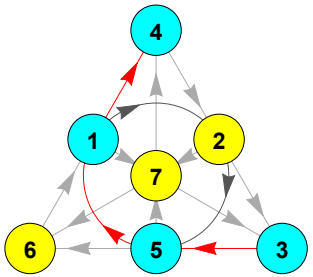
split=3

Fano plane



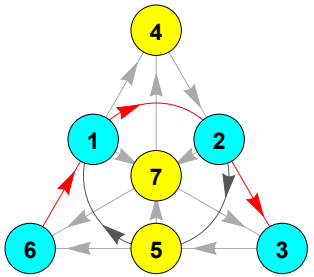
split=5

Fano plane



split=7

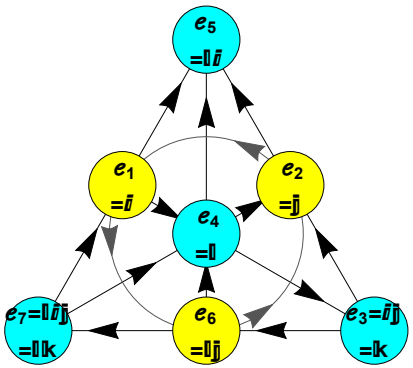
Fano plane



flip=True

{1, 6, 2}{1, 4, 3}{1, 5, 7}{2, 5, 3}{2, 7, 4}{3, 6, 7}{4, 5, 6}

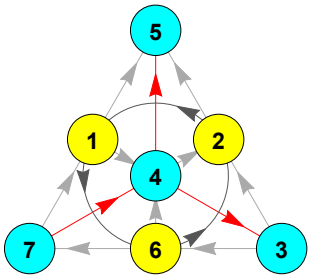
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_4$	e_3	e_7	e_2	$-e_5$
e_2	e_6	-1	$-e_5$	$-e_7$	e_3	$-e_1$	e_4
e_3	e_4	e_5	-1	$-e_1$	$-e_2$	e_7	$-e_6$
e_4	$-e_3$	e_7	e_1	-1	e_6	$-e_5$	$-e_2$
e_5	$-e_7$	$-e_3$	e_2	$-e_6$	-1	e_4	e_1
e_6	$-e_2$	e_1	$-e_7$	e_5	$-e_4$	-1	e_3
e_7	e_5	$-e_4$	e_6	e_2	$-e_1$	$-e_3$	-1

split=1

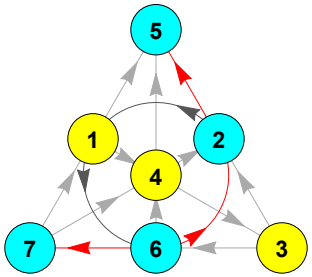
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	-4	3	7	2	-5
2	6	-1	-5	-7	3	-1	4
3	4	5	1	1	2	7	6
4	-3	7	-1	1	-6	-5	2
5	-7	-3	-2	6	1	4	-1
6	-2	1	-7	5	-4	-1	3
7	5	-4	-6	-2	1	-3	1

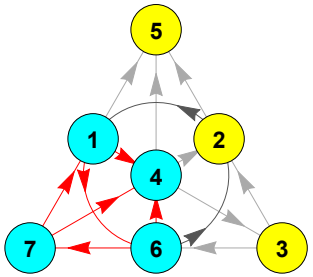
split=2

Fano plane



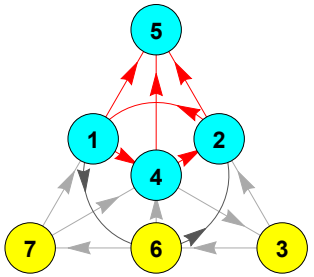
split=4

Fano plane



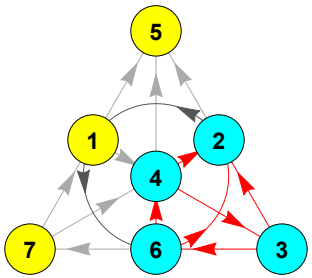
split=6

Fano plane



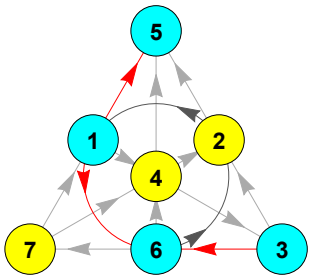
split=3

Fano plane



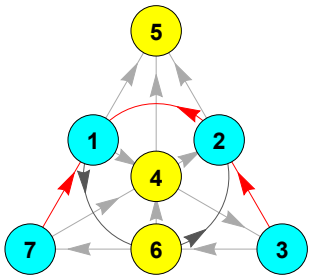
split=5

Fano plane



split=7

Fano plane

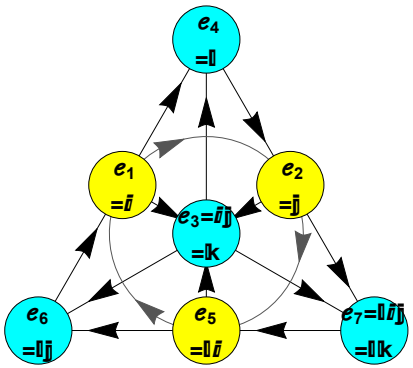


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
76	$c_{g_1}^{0\to 2/3}$		0apggsscc 001100110_2	Bn{ E8{	0 0	0 0	1 0	1 −1	0 0	0 0	1 −1	0 0	} }	$\overline{K}$ 19

flip=False

{1, 2, 5}{1, 3, 7}{1, 4, 6}{2, 3, 6}{2, 7, 4}{3, 4, 5}{5, 6, 7}

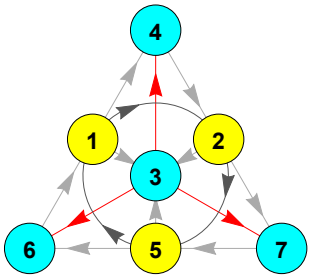
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_7	e_6	$-e_2$	$-e_4$	$-e_3$
e_2	$-e_5$	−1	e_6	$-e_7$	e_1	$-e_3$	e_4
e_3	$-e_7$	$-e_6$	−1	e_5	$-e_4$	e_2	e_1
e_4	$-e_6$	e_7	$-e_5$	−1	e_3	e_1	$-e_2$
e_5	e_2	$-e_1$	e_4	$-e_3$	−1	e_7	$-e_6$
e_6	e_4	e_3	$-e_2$	$-e_1$	$-e_7$	−1	e_5
e_7	e_3	$-e_4$	$-e_1$	e_2	e_6	$-e_5$	−1

split=1

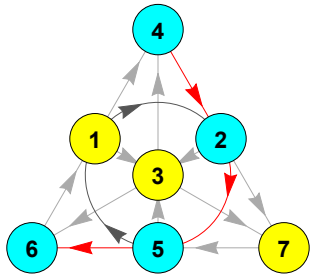
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	7	6	−2	−4	−3
2	−5	−1	6	−7	1	−3	4
3	−7	−6	1	−5	−4	−2	−1
4	−6	7	5	1	3	−1	2
5	2	−1	4	−3	−1	7	−6
6	4	3	2	1	−7	1	−5
7	3	−4	1	−2	6	5	1

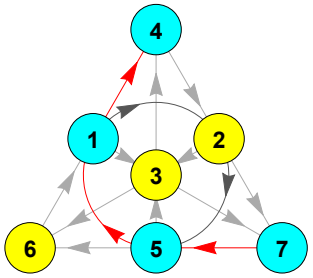
split=2

Fano plane



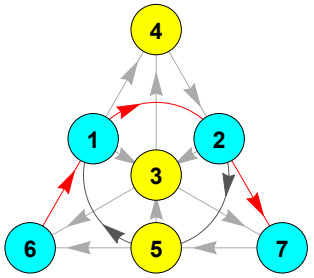
split=4

Fano plane



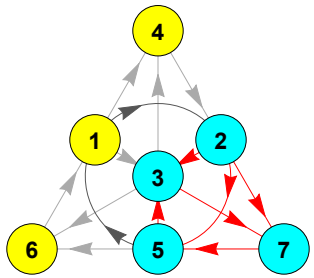
split=6

Fano plane



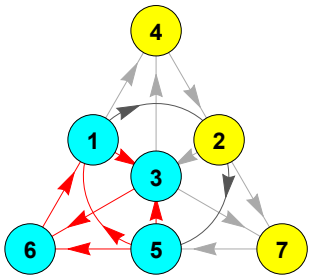
split=3

Fano plane



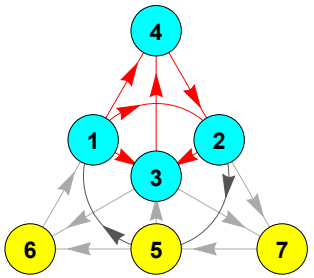
split=5

Fano plane



split=7

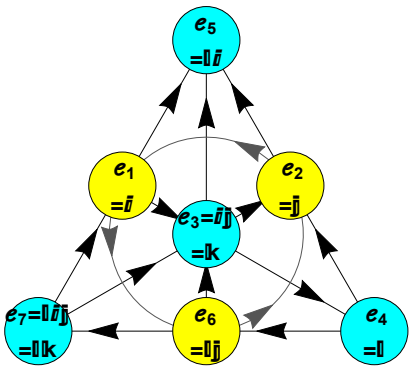
Fano plane



flip=True

{1, 6, 2}{1, 3, 4}{1, 5, 7}{2, 7, 3}{2, 5, 4}{3, 5, 6}{4, 6, 7}

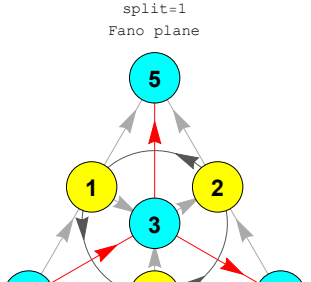
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	e_4	$-e_3$	e_7	e_2	$-e_5$
e_2	e_6	−1	$-e_7$	$-e_5$	e_4	$-e_1$	e_3
e_3	$-e_4$	e_7	−1	e_1	e_6	$-e_5$	$-e_2$
e_4	e_3	e_5	$-e_1$	−1	$-e_2$	e_7	$-e_6$
e_5	$-e_7$	$-e_4$	$-e_6$	e_2	−1	e_3	e_1
e_6	$-e_2$	e_1	e_5	$-e_7$	$-e_3$	−1	e_4
e_7	e_5	$-e_3$	e_2	e_6	$-e_1$	$-e_4$	−1

split=1

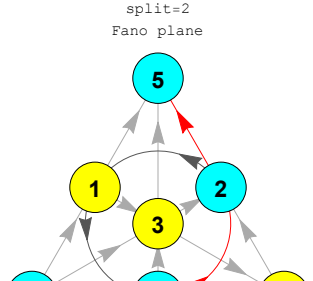
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	4	−3	7	2	−5
2	6	−1	−7	−5	4	−1	3
3	−4	7	1	−1	−6	−5	2
4	3	5	1	1	2	7	6
5	−7	−4	6	−2	1	3	−1
6	−2	1	5	−7	−3	−1	4
7	5	−3	−2	−6	1	−4	1

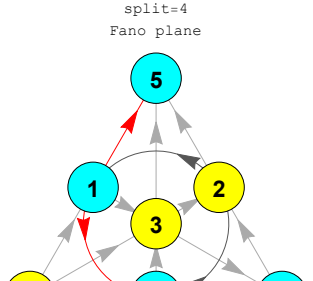
split=2

Fano plane



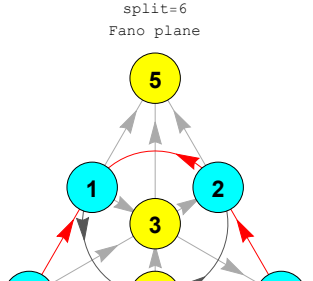
split=4

Fano plane



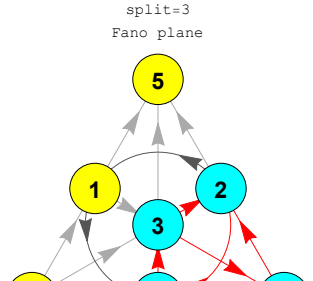
split=6

Fano plane



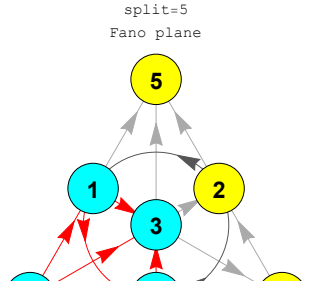
split=3

Fano plane



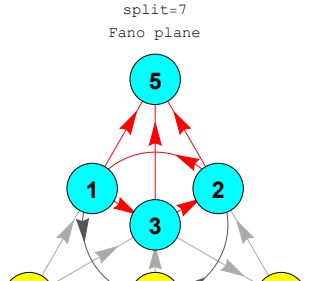
split=5

Fano plane



split=7

Fano plane

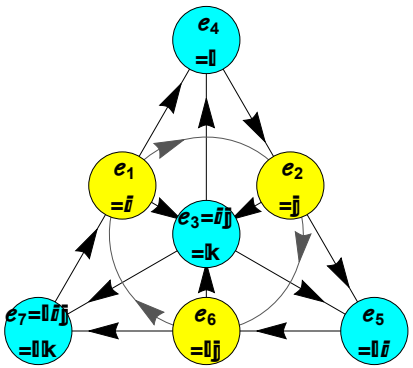


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
77	$c_{b_1}^{2/3}$		0apggsscc 001100111_2	Bn{ E8{	0 0	0 0	1 0	1 −1	0 0	0 0	0 0	1 −1	} }	Bh 107

flip=False

{1, 2, 6}{1, 3, 5}{1, 4, 7}{2, 3, 7}{2, 5, 4}{3, 4, 6}{5, 6, 7}

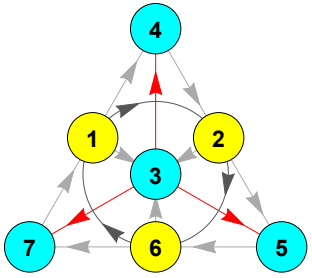
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_5	e_7	$-e_3$	$-e_2$	$-e_4$
e_2	e_2	$-e_6$	−1	e_7	$-e_5$	e_4	e_1	$-e_3$
e_3	e_3	$-e_5$	$-e_7$	−1	e_6	e_1	$-e_4$	e_2
e_4	e_4	$-e_7$	e_5	$-e_6$	−1	$-e_2$	e_3	e_1
e_5	e_5	e_3	$-e_4$	$-e_1$	e_2	−1	e_7	$-e_6$
e_6	e_6	e_2	$-e_1$	e_4	$-e_3$	$-e_7$	−1	e_5
e_7	e_7	e_4	e_3	$-e_2$	$-e_1$	e_6	$-e_5$	−1

split=1

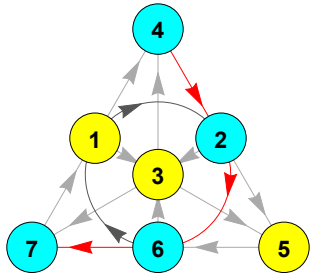
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	5	7	−3	−2	−4
2	−6	−1	7	−5	4	1	−3
3	−5	−7	1	−6	−1	−4	−2
4	−7	5	6	1	2	3	−1
5	3	−4	1	−2	1	7	6
6	2	−1	4	−3	−7	−1	5
7	4	3	2	1	−6	−5	1

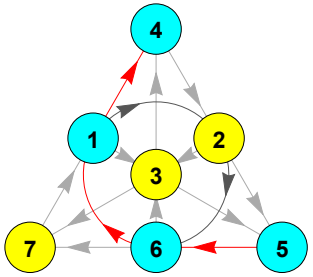
split=2

Fano plane



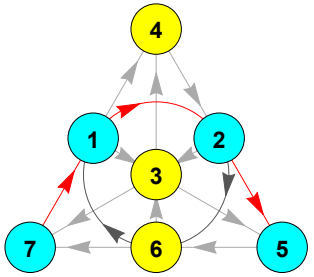
split=4

Fano plane



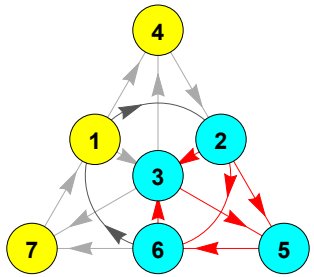
split=6

Fano plane



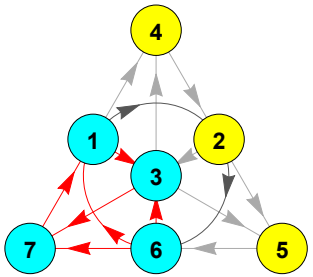
split=3

Fano plane



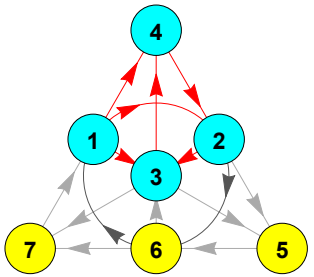
split=5

Fano plane



split=7

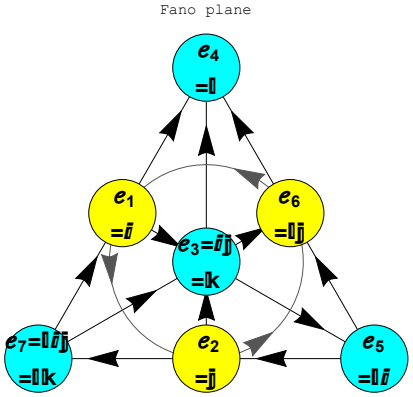
Fano plane



flip=True

{1, 2, 6}{1, 3, 5}{1, 4, 7}{2, 3, 4}{2, 7, 5}{3, 6, 7}{4, 5, 6}

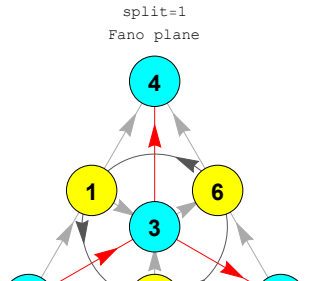
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_5	e_7	$-e_3$	$-e_2$	$-e_4$
e_2	e_2	$-e_6$	−1	e_4	$-e_3$	$-e_7$	e_1	e_5
e_3	e_3	$-e_5$	$-e_4$	−1	e_2	e_1	e_7	$-e_6$
e_4	e_4	$-e_7$	e_3	$-e_2$	−1	e_6	$-e_5$	e_1
e_5	e_5	e_3	e_7	$-e_1$	$-e_6$	−1	e_4	$-e_2$
e_6	e_6	e_2	$-e_1$	$-e_7$	e_5	$-e_4$	−1	e_3
e_7	e_7	e_4	$-e_5$	e_6	$-e_1$	e_2	$-e_3$	−1

split=1

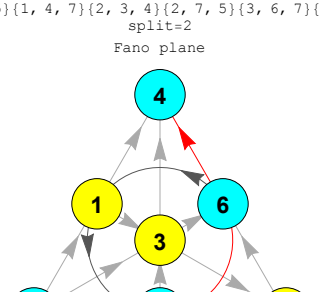
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	5	7	−3	−2	−4
2	−6	−1	4	−3	−7	1	5
3	−5	−4	1	−2	−1	7	6
4	−7	3	2	1	−6	−5	−1
5	3	7	1	6	1	4	2
6	2	−1	−7	5	−4	−1	3
7	4	−5	−6	1	−2	−3	1

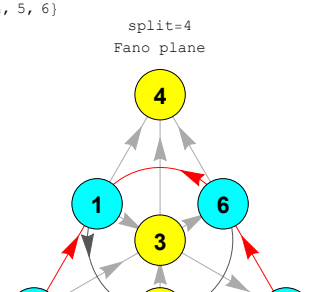
split=2

Fano plane



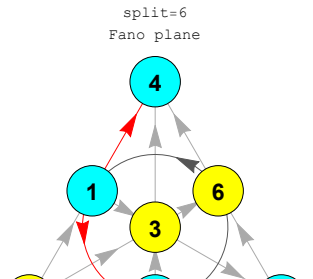
split=4

Fano plane



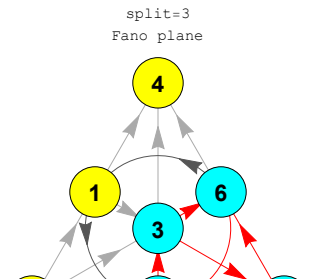
split=6

Fano plane



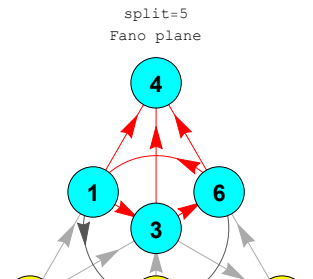
split=3

Fano plane



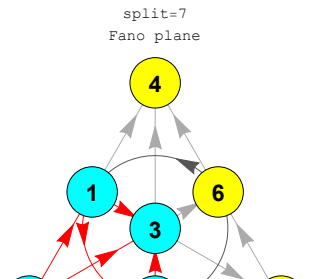
split=5

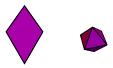
Fano plane



split=7

Fano plane

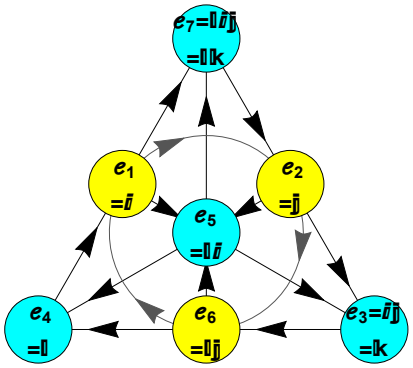


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
78	$\overline{\frac{s}{m_d}}^{\frac{1}{3}\mapsto 4/3}$		0apggsscc 010100011_2	Bn{ E8{	0 0	0 0	1 0	0 -1	1 0	1 0	0 0	0 1	} }	$\overline{Uus}$ 117

flip=False

{1, 2, 6}{1, 5, 3}{1, 7, 4}{2, 3, 7}{2, 5, 4}{3, 6, 4}{5, 7, 6}

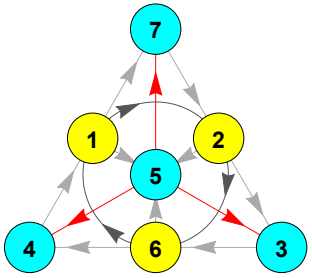
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_5$	$-e_7$	e_3	$-e_2$	e_4
e_2	$-e_6$	-1	e_7	$-e_5$	e_4	e_1	$-e_3$
e_3	e_5	$-e_7$	-1	$-e_6$	$-e_1$	e_4	e_2
e_4	e_7	e_5	e_6	-1	$-e_2$	$-e_3$	$-e_1$
e_5	$-e_3$	$-e_4$	e_1	e_2	-1	$-e_7$	e_6
e_6	e_2	$-e_1$	$-e_4$	e_3	e_7	-1	$-e_5$
e_7	$-e_4$	e_3	$-e_2$	e_1	$-e_6$	e_5	-1

split=1

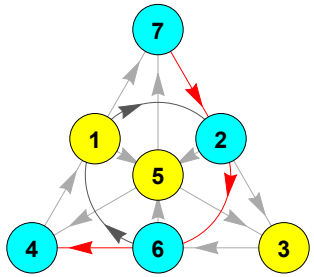
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	-5	-7	3	-2	4
2	-6	-1	7	-5	4	1	-3
3	5	-7	1	6	1	4	-2
4	7	5	-6	1	2	-3	1
5	-3	-4	-1	-2	1	-7	-6
6	2	-1	-4	3	7	-1	-5
7	-4	3	2	-1	6	5	1

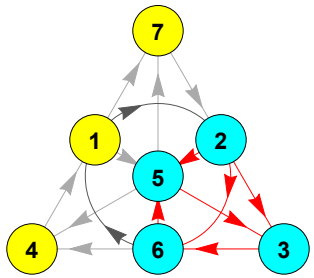
split=2

Fano plane



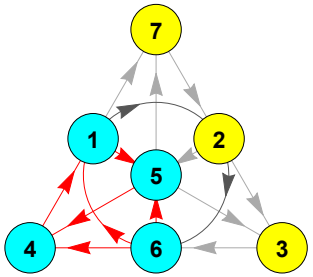
split=3

Fano plane



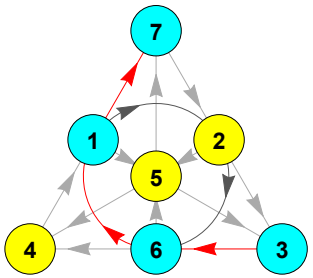
split=4

Fano plane



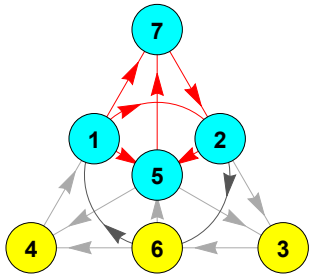
split=5

Fano plane



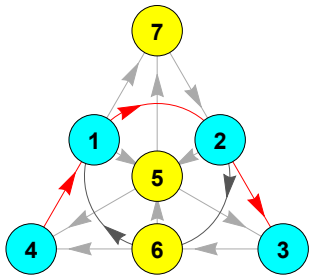
split=6

Fano plane



split=7

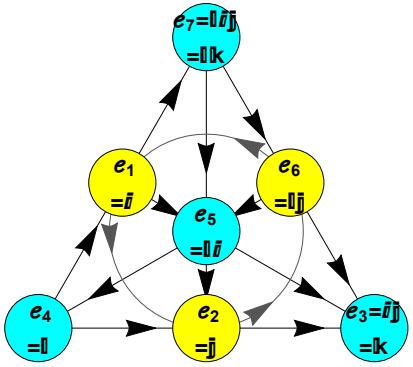
Fano plane



flip=True

{1, 2, 6}{1, 5, 3}{1, 7, 4}{2, 3, 4}{2, 7, 5}{3, 7, 6}{4, 6, 5}

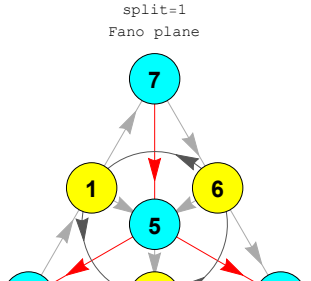
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_5$	$-e_7$	e_3	$-e_2$	e_4
e_2	$-e_6$	-1	e_4	$-e_3$	$-e_7$	e_1	e_5
e_3	e_5	$-e_4$	-1	e_2	$-e_1$	$-e_7$	e_6
e_4	e_7	e_3	$-e_2$	-1	$-e_6$	e_5	$-e_1$
e_5	$-e_3$	e_7	e_1	e_6	-1	$-e_4$	$-e_2$
e_6	e_2	$-e_1$	e_7	$-e_5$	e_4	-1	$-e_3$
e_7	$-e_4$	$-e_5$	$-e_6$	e_1	e_2	e_3	-1

split=1

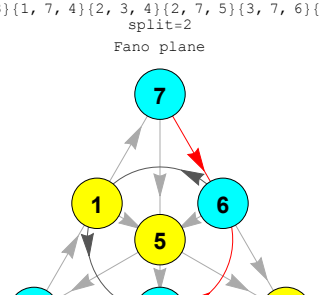
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	-5	-7	3	-2	4
2	-6	-1	4	-3	-7	1	5
3	5	-4	1	-2	1	-7	-6
4	7	3	2	1	6	5	1
5	-3	7	-1	-6	1	-4	2
6	2	-1	7	-5	4	-1	-3
7	-4	-5	6	-1	-2	3	1

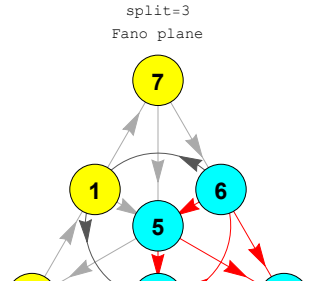
split=2

Fano plane



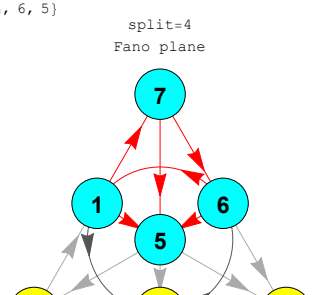
split=3

Fano plane



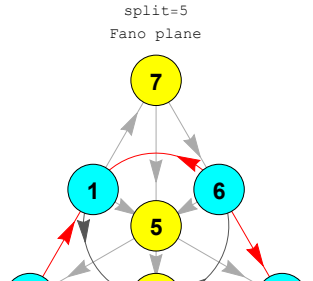
split=4

Fano plane



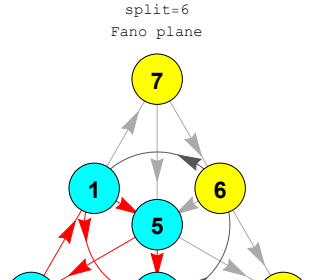
split=5

Fano plane



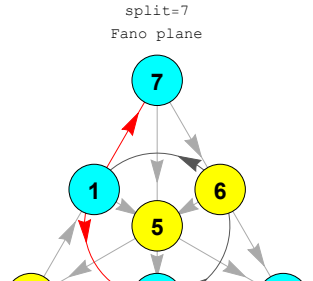
split=6

Fano plane



split=7

Fano plane

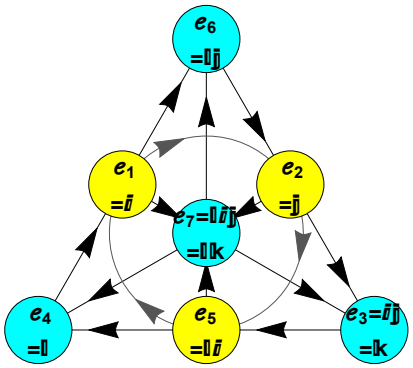


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates								Ele #
79	$\overline{s}_{c_d}{}^{+\to 4/3}_{L}$		0apggsscc	010100010_2	Bn{	0	0	1	0	1	0	1	0 }	$\overline{Ar}$ 18
					E8{	0	0	0	−1	0	0	1	0 }	

flip=False

{1, 2, 5}{1, 7, 3}{1, 6, 4}{2, 3, 6}{2, 7, 4}{3, 5, 4}{5, 7, 6}

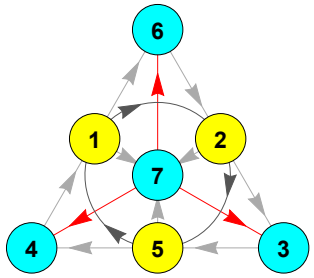
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_5	$-e_7$	$-e_6$	$-e_2$	e_4	e_3
e_2	e_2	$-e_5$	-1	e_6	$-e_7$	e_1	$-e_3$	e_4
e_3	e_3	e_7	$-e_6$	-1	$-e_5$	e_4	e_2	$-e_1$
e_4	e_4	e_6	e_7	e_5	-1	$-e_3$	$-e_1$	$-e_2$
e_5	e_5	e_2	$-e_1$	$-e_4$	e_3	-1	$-e_7$	e_6
e_6	e_6	$-e_4$	e_3	$-e_2$	e_1	e_7	-1	$-e_5$
e_7	e_7	$-e_3$	$-e_4$	e_1	e_2	$-e_6$	e_5	-1

split=1

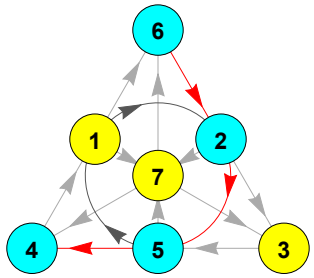
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−7	−6	−2	4	3
2	−5	−1	6	−7	1	−3	4
3	7	−6	1	5	4	−2	1
4	6	7	−5	1	−3	1	2
5	2	−1	−4	3	−1	−7	6
6	−4	3	2	−1	7	1	5
7	−3	−4	−1	−2	−6	−5	1

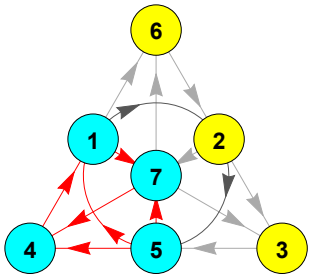
split=2

Fano plane



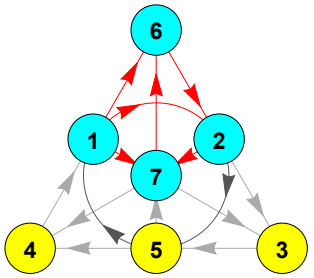
split=4

Fano plane



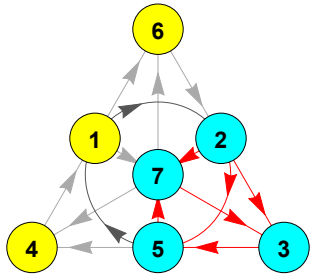
split=6

Fano plane



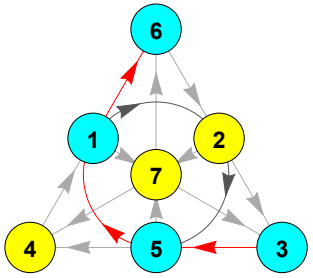
split=3

Fano plane



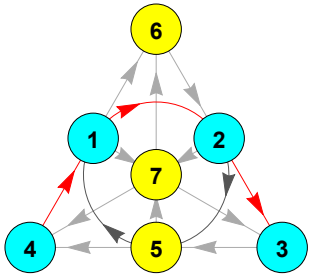
split=5

Fano plane



split=7

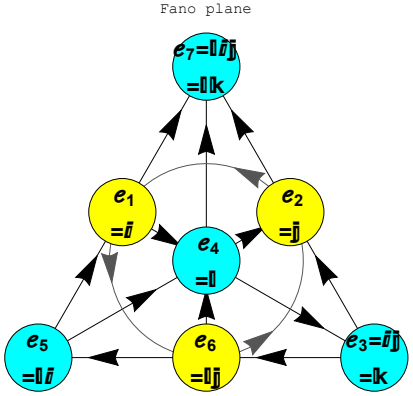
Fano plane



flip=True

{1, 6, 2}{1, 4, 3}{1, 7, 5}{2, 7, 3}{2, 5, 4}{3, 6, 5}{4, 7, 6}

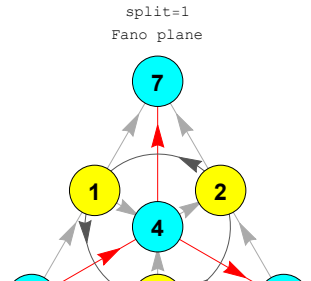
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	$-e_6$	$-e_4$	e_3	$-e_7$	e_2	e_5
e_2	e_2	e_6	-1	$-e_7$	$-e_5$	e_4	$-e_1$	e_3
e_3	e_3	e_4	e_7	-1	$-e_1$	$-e_6$	e_5	$-e_2$
e_4	e_4	$-e_3$	e_5	e_1	-1	$-e_2$	$-e_7$	e_6
e_5	e_5	e_7	$-e_4$	e_6	e_2	-1	$-e_3$	$-e_1$
e_6	e_6	$-e_2$	e_1	$-e_5$	e_7	e_3	-1	$-e_4$
e_7	e_7	$-e_5$	$-e_3$	e_2	$-e_6$	e_1	e_4	-1

split=1

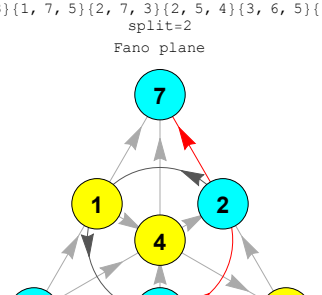
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−4	3	−7	2	5
2	6	−1	−7	−5	4	−1	3
3	4	7	1	1	6	5	2
4	−3	5	−1	1	2	−7	−6
5	7	−4	−6	−2	1	−3	1
6	−2	1	−5	7	3	−1	−4
7	−5	−3	−2	6	−1	4	1

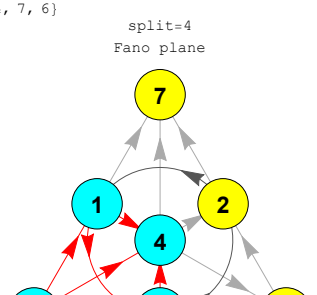
split=2

Fano plane



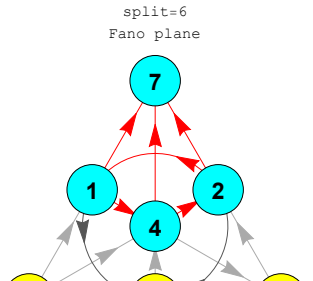
split=4

Fano plane



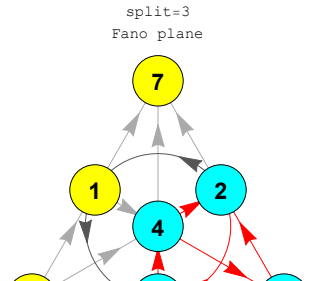
split=6

Fano plane



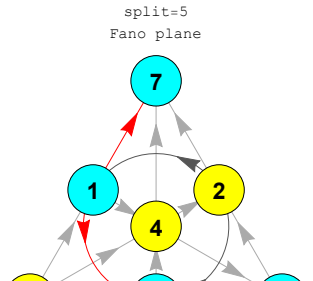
split=3

Fano plane



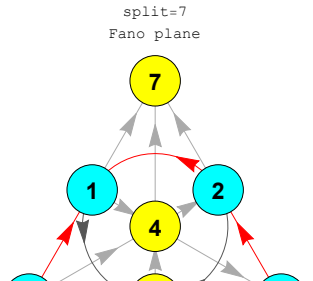
split=5

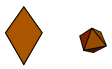
Fano plane



split=7

Fano plane

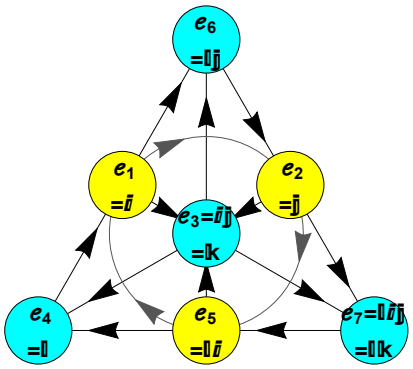


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
80	$\overline{s}_{o_d}{}^{\tau\mapsto 4/3}$		0apggsscc 010100001_2	Bn{ E8{	0 0	0 0	1 0	0 −1	1 0	0 1	0 0	1 0	} }	$\overline{Mg}$ 12

flip=False

{1, 2, 5}{1, 3, 7}{1, 6, 4}{2, 3, 4}{2, 7, 6}{3, 6, 5}{4, 7, 5}

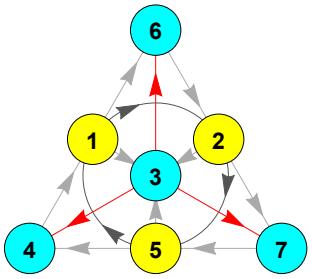
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_7	$-e_6$	$-e_2$	e_4	$-e_3$
e_2	$-e_5$	−1	e_4	$-e_3$	e_1	$-e_7$	e_6
e_3	$-e_7$	$-e_4$	−1	e_2	$-e_6$	e_5	e_1
e_4	e_6	e_3	$-e_2$	−1	$-e_7$	$-e_1$	e_5
e_5	e_2	$-e_1$	e_6	e_7	−1	$-e_3$	$-e_4$
e_6	$-e_4$	e_7	$-e_5$	e_1	e_3	−1	$-e_2$
e_7	e_3	$-e_6$	$-e_1$	$-e_5$	e_4	e_2	−1

split=1

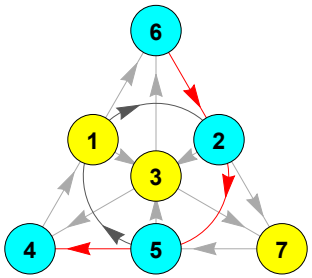
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	7	−6	−2	4	−3
2	−5	−1	4	−3	1	−7	6
3	−7	−4	1	−2	−6	−5	−1
4	6	3	2	1	−7	1	−5
5	2	−1	6	7	−1	−3	−4
6	−4	7	5	−1	3	1	2
7	3	−6	1	5	4	−2	1

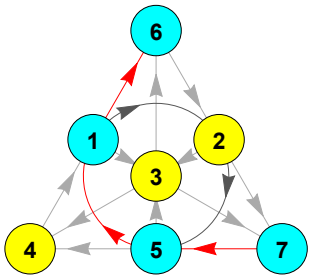
split=2

Fano plane



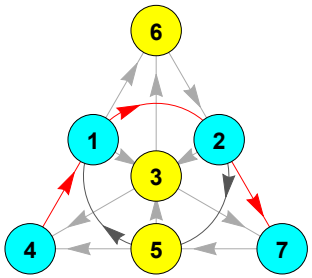
split=4

Fano plane



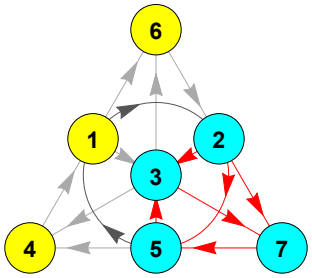
split=6

Fano plane



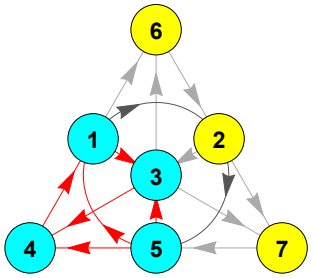
split=3

Fano plane



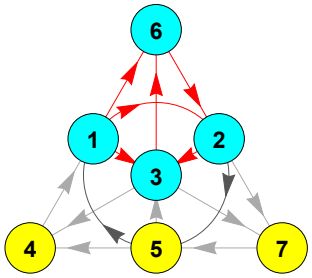
split=5

Fano plane



split=7

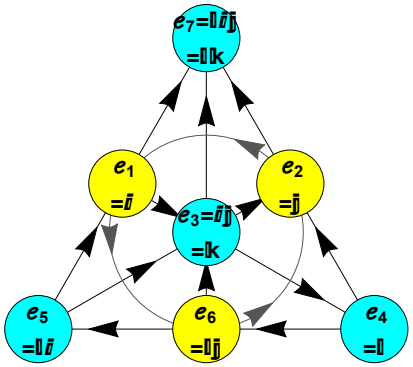
Fano plane



flip=True

{1, 6, 2}{1, 3, 4}{1, 7, 5}{2, 5, 3}{2, 7, 4}{3, 7, 6}{4, 6, 5}

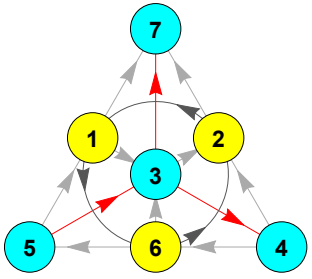
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	e_4	$-e_3$	$-e_7$	e_2	e_5
e_2	e_6	−1	$-e_5$	$-e_7$	e_3	$-e_1$	e_4
e_3	$-e_4$	e_5	−1	e_1	$-e_2$	$-e_7$	e_6
e_4	e_3	e_7	$-e_1$	−1	$-e_6$	e_5	$-e_2$
e_5	e_7	$-e_3$	e_2	e_6	−1	$-e_4$	$-e_1$
e_6	$-e_2$	e_1	e_7	$-e_5$	e_4	−1	$-e_3$
e_7	$-e_5$	$-e_4$	$-e_6$	e_2	e_1	e_3	−1

split=1

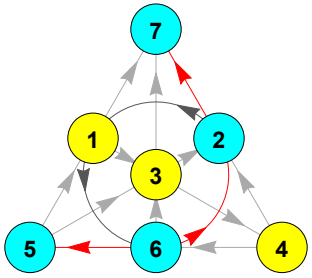
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	4	−3	−7	2	5
2	6	−1	−5	−7	3	−1	4
3	−4	5	1	−1	2	−7	−6
4	3	7	1	1	6	5	2
5	7	−3	−2	−6	1	−4	1
6	−2	1	7	−5	4	−1	−3
7	−5	−4	6	−2	−1	3	1

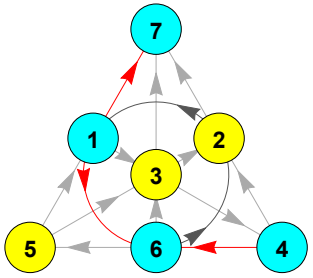
split=2

Fano plane



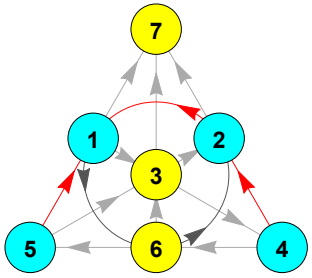
split=4

Fano plane



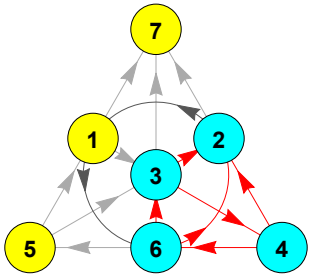
split=6

Fano plane



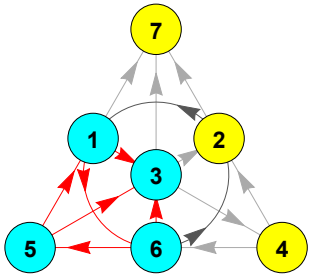
split=3

Fano plane



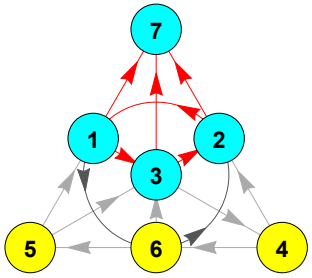
split=5

Fano plane



split=7

Fano plane

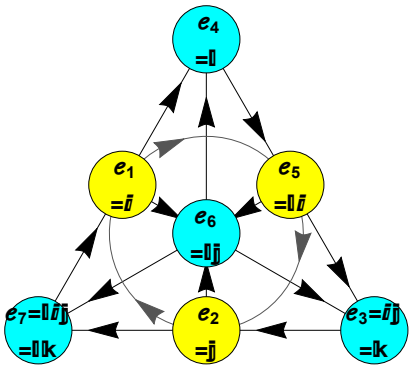


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
81	$V_{\mu}^{0\to1}$ w_1 R		0apggsscc 001100100$_2$	Bn{ E8{	0 0	0 0	1 0	0 −1	0 1	1 0	1 0	0 0	} }	$\bar{B}$ 5

flip=False

{1, 5, 2}{1, 6, 3}{1, 4, 7}{2, 7, 3}{2, 6, 4}{3, 4, 5}{5, 6, 7}

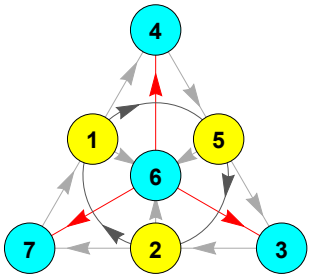
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	$-e_6$	e_7	e_2	e_3	$-e_4$
e_2	e_2	e_5	−1	$-e_7$	$-e_6$	$-e_1$	e_4	e_3
e_3	e_3	e_6	e_7	−1	e_5	$-e_4$	$-e_1$	$-e_2$
e_4	e_4	$-e_7$	e_6	$-e_5$	−1	e_3	$-e_2$	e_1
e_5	e_5	$-e_2$	e_1	e_4	$-e_3$	−1	e_7	$-e_6$
e_6	e_6	$-e_3$	$-e_4$	e_1	e_2	$-e_7$	−1	e_5
e_7	e_7	e_4	$-e_3$	e_2	$-e_1$	e_6	$-e_5$	−1

split=1

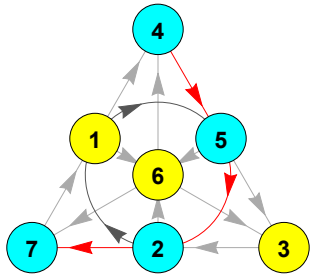
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−6	7	2	3	−4
2	5	−1	−7	−6	−1	4	3
3	6	7	1	−5	−4	1	2
4	−7	6	5	1	3	2	−1
5	−2	1	4	−3	−1	7	−6
6	−3	−4	−1	−2	−7	1	−5
7	4	−3	−2	1	6	5	1

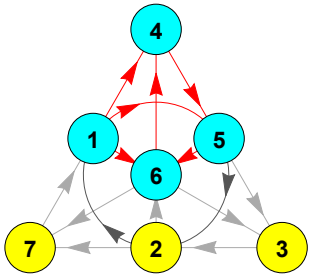
split=2

Fano plane



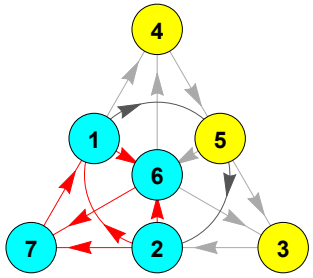
split=4

Fano plane



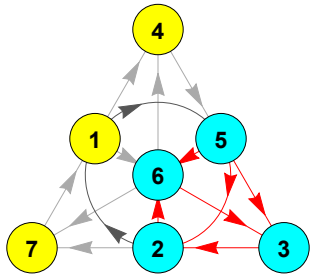
split=6

Fano plane



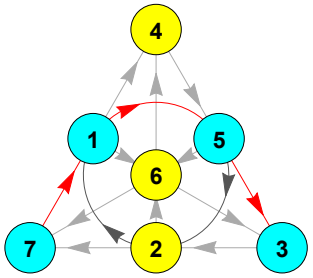
split=3

Fano plane



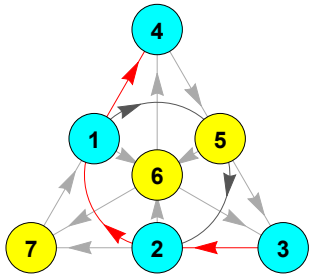
split=5

Fano plane



split=7

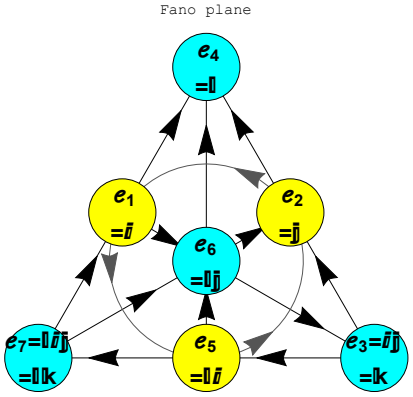
Fano plane



flip=True

{1, 5, 2}{1, 6, 3}{1, 4, 7}{2, 4, 3}{2, 7, 6}{3, 5, 7}{4, 5, 6}

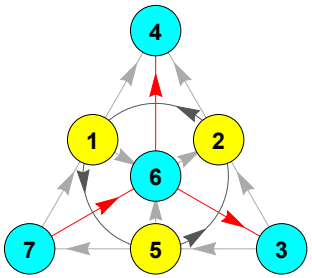
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	$-e_6$	e_7	e_2	e_3	$-e_4$
e_2	e_2	e_5	−1	$-e_4$	e_3	$-e_1$	$-e_7$	e_6
e_3	e_3	e_6	e_4	−1	$-e_2$	e_7	$-e_1$	$-e_5$
e_4	e_4	$-e_7$	$-e_3$	e_2	−1	e_6	$-e_5$	e_1
e_5	e_5	$-e_2$	e_1	$-e_7$	$-e_6$	−1	e_4	e_3
e_6	e_6	$-e_3$	e_7	e_1	e_5	$-e_4$	−1	$-e_2$
e_7	e_7	e_4	$-e_6$	e_5	$-e_1$	$-e_3$	e_2	−1

split=1

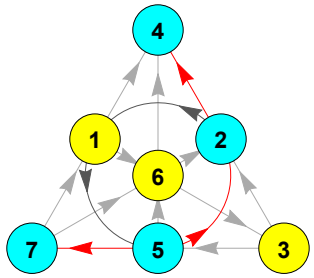
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−6	7	2	3	−4
2	5	−1	−4	3	−1	−7	6
3	6	4	1	2	7	1	5
4	−7	−3	−2	1	6	5	−1
5	−2	1	−7	−6	−1	4	3
6	−3	7	−1	−5	−4	1	2
7	4	−6	−5	1	−3	−2	1

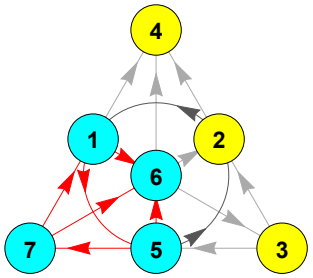
split=2

Fano plane



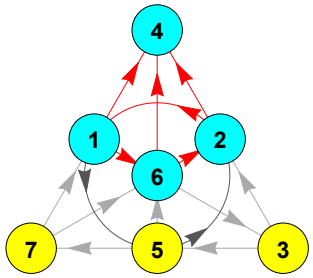
split=4

Fano plane



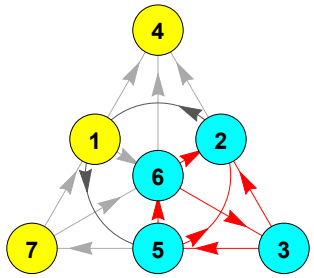
split=6

Fano plane



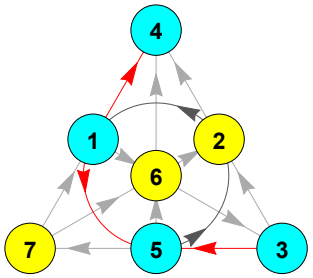
split=3

Fano plane



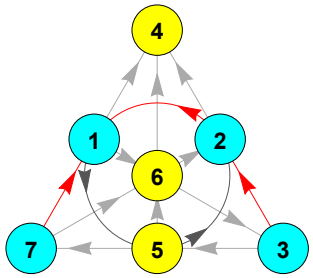
split=5

Fano plane



split=7

Fano plane

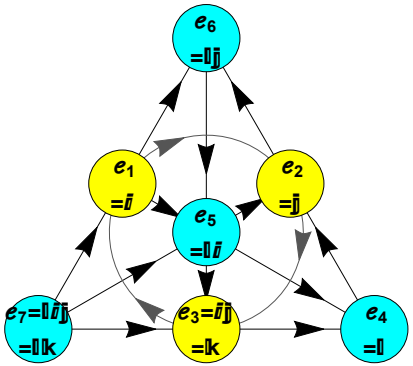


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates									Ele #
82	$\overline{\Phi x_1}^{\,0\mapsto -1/3}_{o_m}$			0apggsscc 010001001_2	Bn{ E8{	0 0	0 0	1 0	0 0	0 −1	1 −1	0 0	1 0	} }	$\overline{S}$ 16

flip=False

{1, 2, 3}{1, 5, 4}{1, 6, 7}{2, 6, 4}{2, 7, 5}{3, 4, 7}{3, 6, 5}

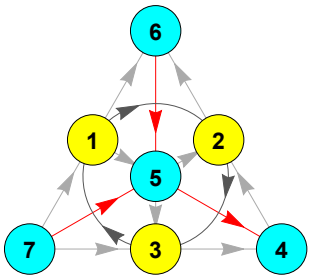
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	$-e_5$	e_4	e_7	$-e_6$
e_2	$-e_3$	−1	e_1	$-e_6$	$-e_7$	e_4	e_5
e_3	e_2	$-e_1$	−1	e_7	$-e_6$	e_5	$-e_4$
e_4	e_5	e_6	$-e_7$	−1	$-e_1$	$-e_2$	e_3
e_5	$-e_4$	e_7	e_6	e_1	−1	$-e_3$	$-e_2$
e_6	$-e_7$	$-e_4$	$-e_5$	e_2	e_3	−1	e_1
e_7	e_6	$-e_5$	e_4	$-e_3$	e_2	$-e_1$	−1

split=1

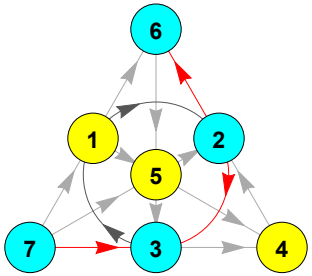
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−5	4	7	−6
2	−3	−1	1	−6	−7	4	5
3	2	−1	−1	7	−6	5	−4
4	5	6	−7	1	1	2	−3
5	−4	7	6	−1	1	3	2
6	−7	−4	−5	−2	−3	1	−1
7	6	−5	4	3	−2	1	1

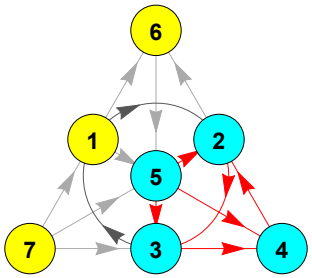
split=2

Fano plane



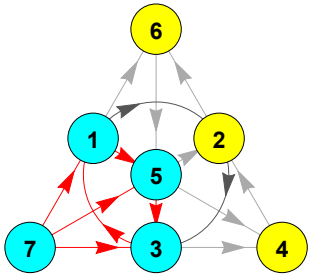
split=3

Fano plane



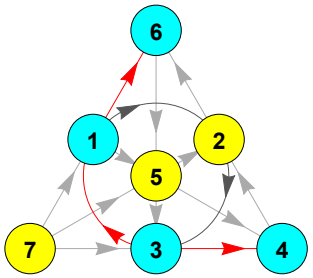
split=4

Fano plane



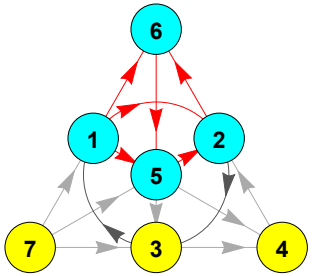
split=5

Fano plane



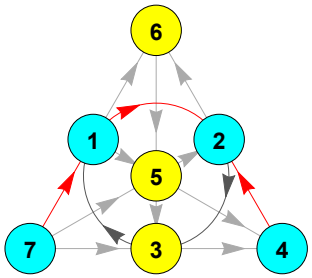
split=6

Fano plane



split=7

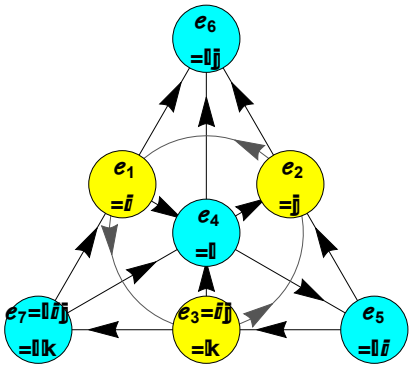
Fano plane



flip=True

{1, 3, 2}{1, 4, 5}{1, 6, 7}{2, 7, 4}{2, 6, 5}{3, 4, 6}{3, 7, 5}

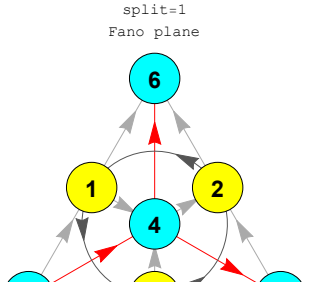
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	e_2	e_5	$-e_4$	e_7	$-e_6$
e_2	e_3	−1	$-e_1$	$-e_7$	$-e_6$	e_5	e_4
e_3	$-e_2$	e_1	−1	e_6	$-e_7$	$-e_4$	e_5
e_4	$-e_5$	e_7	$-e_6$	−1	e_1	e_3	$-e_2$
e_5	e_4	e_6	e_7	$-e_1$	−1	$-e_2$	$-e_3$
e_6	$-e_7$	$-e_5$	e_4	$-e_3$	e_2	−1	e_1
e_7	e_6	$-e_4$	$-e_5$	e_2	e_3	$-e_1$	−1

split=1

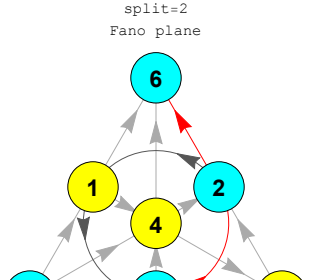
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	5	−4	7	−6
2	3	−1	−1	−7	−6	5	4
3	−2	1	−1	6	−7	−4	5
4	−5	7	−6	1	−1	−3	2
5	4	6	7	1	1	2	3
6	−7	−5	4	3	−2	1	−1
7	6	−4	−5	−2	−3	1	1

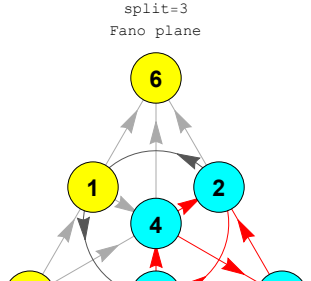
split=2

Fano plane



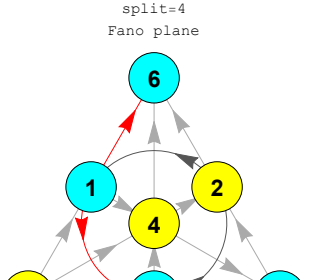
split=3

Fano plane



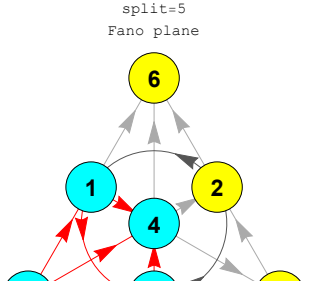
split=4

Fano plane



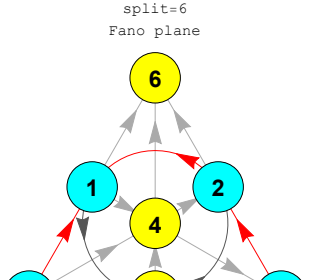
split=5

Fano plane



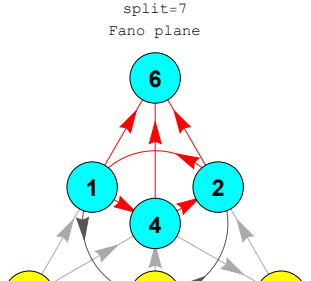
split=6

Fano plane



split=7

Fano plane

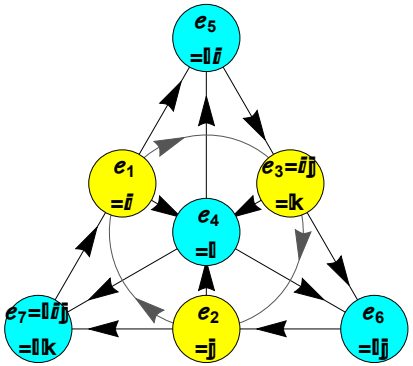


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
83	$\overline{\Phi X_2}_{Cm}^{0\mapsto -1/3}$		0apggsscc 010001010_2	Bn{ 0 0 1 0 0 0 1 1 } E8{ 0 0 0 0 -1 0 -1 0 }	$\overline{Ne}$ 10

flip=False

{1, 3, 2}{1, 4, 6}{1, 5, 7}{2, 4, 5}{2, 7, 6}{3, 4, 7}{3, 6, 5}

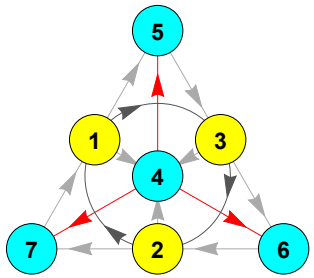
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	e_6	e_7	$-e_4$	$-e_5$
e_2	e_3	-1	$-e_1$	e_5	$-e_4$	$-e_7$	e_6
e_3	$-e_2$	e_1	-1	e_7	$-e_6$	e_5	$-e_4$
e_4	$-e_6$	$-e_5$	$-e_7$	-1	e_2	e_1	e_3
e_5	$-e_7$	e_4	e_6	$-e_2$	-1	$-e_3$	e_1
e_6	e_4	e_7	$-e_5$	$-e_1$	e_3	-1	$-e_2$
e_7	e_5	$-e_6$	e_4	$-e_3$	$-e_1$	e_2	-1

split=1

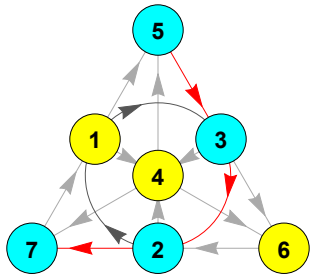
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	6	7	-4	-5
2	3	-1	-1	5	-4	-7	6
3	-2	1	-1	7	-6	5	-4
4	-6	-5	-7	1	-2	-1	-3
5	-7	4	6	2	1	3	-1
6	4	7	-5	1	-3	1	2
7	5	-6	4	3	1	-2	1

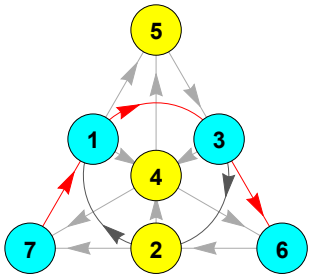
split=2

Fano plane



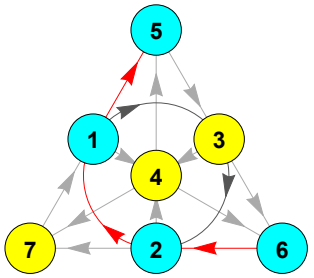
split=4

Fano plane



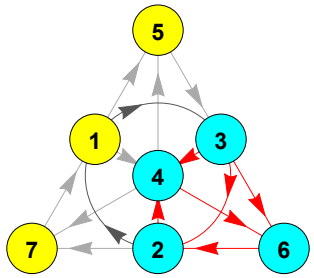
split=6

Fano plane



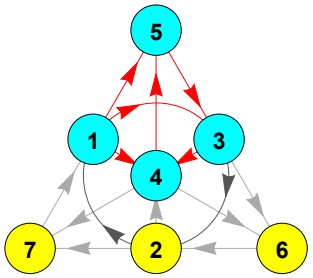
split=3

Fano plane



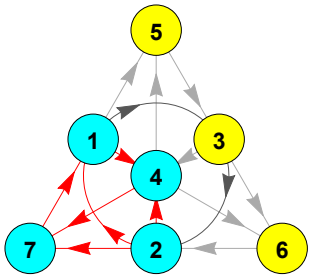
split=5

Fano plane



split=7

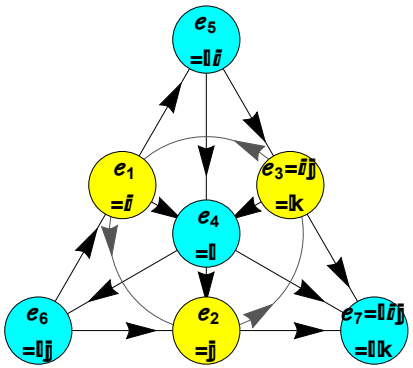
Fano plane



flip=True

{1, 2, 3}{1, 4, 7}{1, 5, 6}{2, 5, 4}{2, 7, 6}{3, 4, 6}{3, 7, 5}

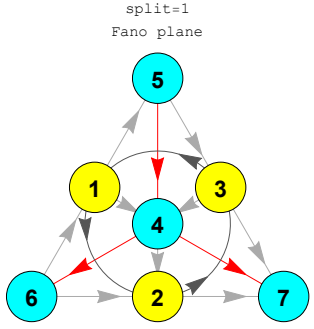
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_7	e_6	$-e_5$	$-e_4$
e_2	$-e_3$	-1	e_1	$-e_5$	e_4	$-e_7$	e_6
e_3	e_2	$-e_1$	-1	e_6	$-e_7$	$-e_4$	e_5
e_4	$-e_7$	e_5	$-e_6$	-1	$-e_2$	e_3	e_1
e_5	$-e_6$	$-e_4$	e_7	e_2	-1	e_1	$-e_3$
e_6	e_5	e_7	e_4	$-e_3$	$-e_1$	-1	$-e_2$
e_7	e_4	$-e_6$	$-e_5$	$-e_1$	e_3	e_2	-1

split=1

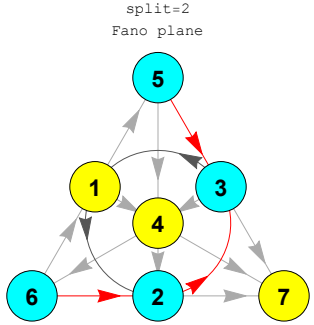
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	7	6	-5	-4
2	-3	-1	1	-5	4	-7	6
3	2	-1	-1	6	-7	-4	5
4	-7	5	-6	1	2	-3	-1
5	-6	-4	7	-2	1	-1	3
6	5	7	4	3	1	1	2
7	4	-6	-5	1	-3	-2	1

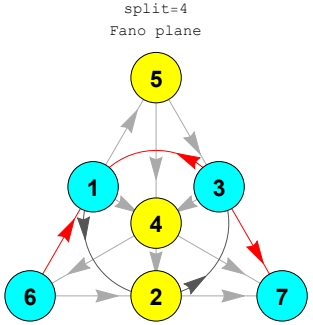
split=2

Fano plane



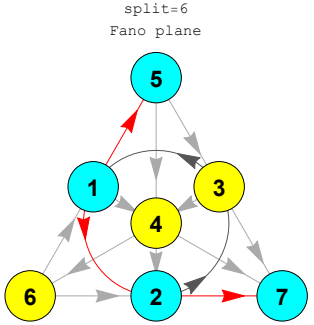
split=4

Fano plane



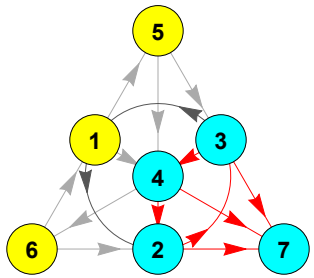
split=6

Fano plane



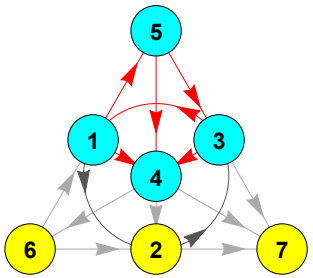
split=3

Fano plane



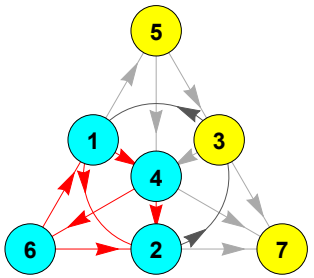
split=5

Fano plane



split=7

Fano plane

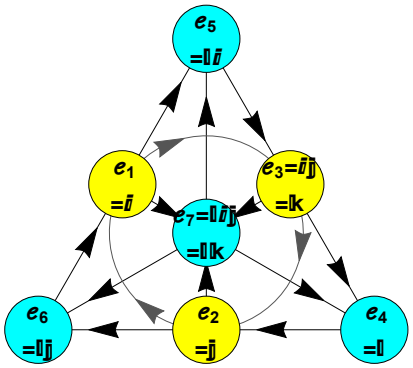


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
84	$\frac{\overline{\text{dx}_3}}{m_m}{}^{0\mapsto -1/3}_{t}$		0apggsscc 010001011_2	Bn{ E8{	0 0	0 0	0 0	1 0	1 -1	1 0	0 0	0 -1	} }	Ds 110

flip=False

{1, 3, 2}{1, 7, 4}{1, 5, 6}{2, 6, 4}{2, 7, 5}{3, 4, 5}{3, 7, 6}

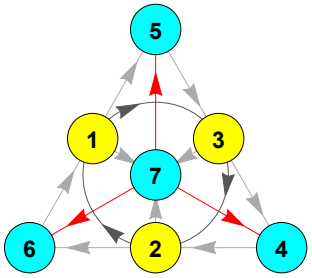
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_7$	e_6	$-e_5$	e_4
e_2	e_3	-1	$-e_1$	$-e_6$	$-e_7$	e_4	e_5
e_3	$-e_2$	e_1	-1	e_5	$-e_4$	$-e_7$	e_6
e_4	e_7	e_6	$-e_5$	-1	e_3	$-e_2$	$-e_1$
e_5	$-e_6$	e_7	e_4	$-e_3$	-1	e_1	$-e_2$
e_6	e_5	$-e_4$	e_7	e_2	$-e_1$	-1	$-e_3$
e_7	$-e_4$	$-e_5$	$-e_6$	e_1	e_2	e_3	-1

split=1

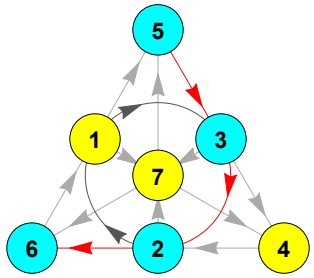
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-7	6	-5	4
2	3	-1	-1	-6	-7	4	5
3	-2	1	-1	5	-4	-7	6
4	7	6	-5	1	-3	2	1
5	-6	7	4	3	1	-1	2
6	5	-4	7	-2	1	1	3
7	-4	-5	-6	-1	-2	-3	1

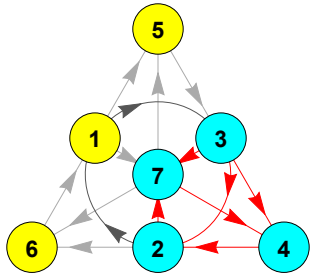
split=2

Fano plane



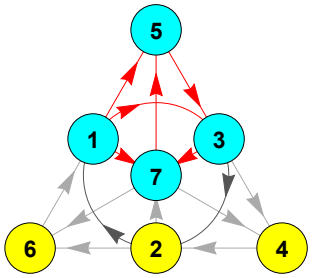
split=3

Fano plane



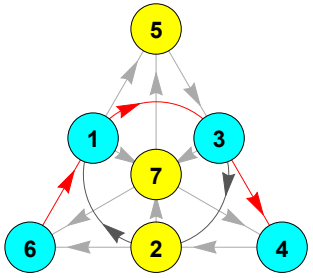
split=4

Fano plane



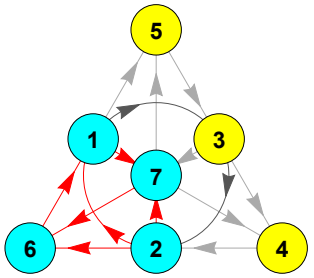
split=5

Fano plane



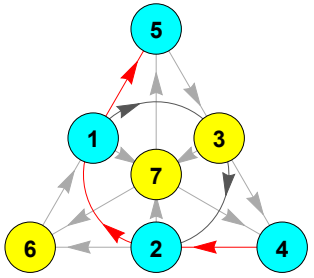
split=6

Fano plane



split=7

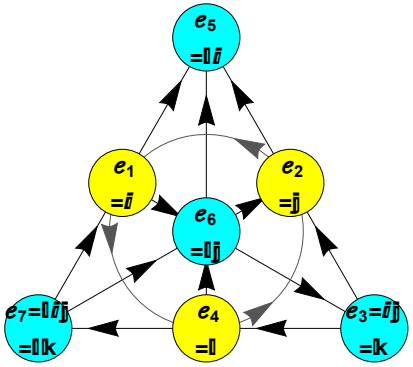
Fano plane



flip=True

{1, 4, 2}{1, 6, 3}{1, 5, 7}{2, 5, 3}{2, 7, 6}{3, 4, 7}{4, 6, 5}

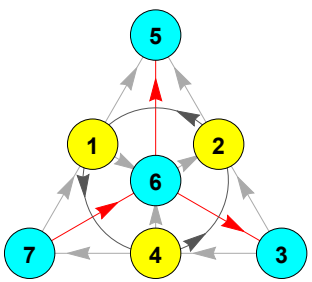
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_4$	$-e_6$	e_2	e_7	e_3	$-e_5$
e_2	e_4	-1	$-e_5$	$-e_1$	e_3	$-e_7$	e_6
e_3	e_6	e_5	-1	e_7	$-e_2$	$-e_1$	$-e_4$
e_4	$-e_2$	e_1	$-e_7$	-1	$-e_6$	e_5	e_3
e_5	$-e_7$	$-e_3$	e_2	e_6	-1	$-e_4$	e_1
e_6	$-e_3$	e_7	e_1	$-e_5$	e_4	-1	$-e_2$
e_7	e_5	$-e_6$	e_4	$-e_3$	$-e_1$	e_2	-1

split=1

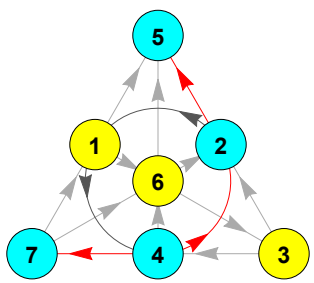
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	-6	2	7	3	-5
2	4	-1	-5	-1	3	-7	6
3	6	5	1	7	2	1	4
4	-2	1	-7	-1	-6	5	3
5	-7	-3	-2	6	1	4	-1
6	-3	7	-1	-5	-4	1	2
7	5	-6	-4	-3	1	-2	1

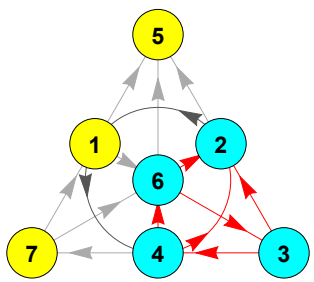
split=2

Fano plane



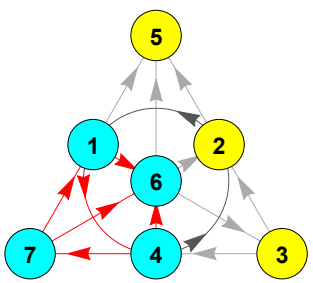
split=3

Fano plane



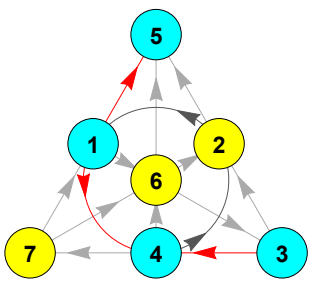
split=4

Fano plane



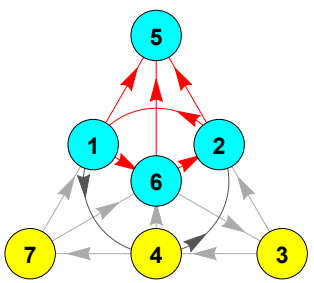
split=5

Fano plane



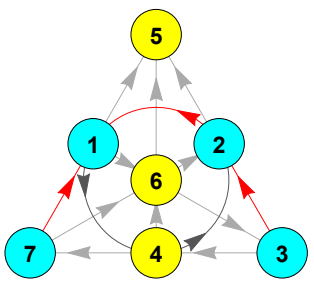
split=6

Fano plane



split=7

Fano plane

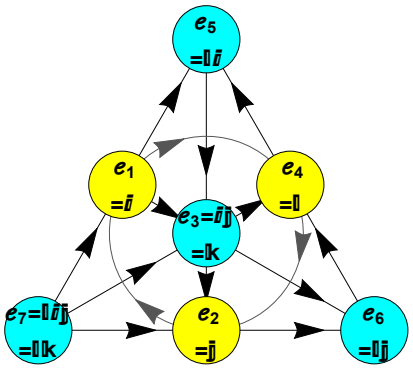


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
85	Φ_{X_3} m_d $^{0\to 1/3}_{L}$		0apggsscc 000000011_2	Bn{ 0 0 0 1 1 0 1 0 } E8{ 0 0 0 0 -1 0 0 1 }	$\overline{\text{Lv}}$ 116

flip=False

{1, 4, 2}{1, 3, 6}{1, 5, 7}{2, 5, 3}{2, 6, 7}{3, 4, 7}{4, 5, 6}

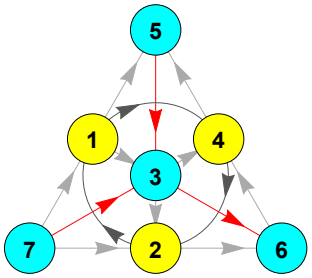
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_4$	e_6	e_2	e_7	$-e_3$	$-e_5$
e_2	e_4	-1	$-e_5$	$-e_1$	e_3	e_7	$-e_6$
e_3	$-e_6$	e_5	-1	e_7	$-e_2$	e_1	$-e_4$
e_4	$-e_2$	e_1	$-e_7$	-1	e_6	$-e_5$	e_3
e_5	$-e_7$	$-e_3$	e_2	$-e_6$	-1	e_4	e_1
e_6	e_3	$-e_7$	$-e_1$	e_5	$-e_4$	-1	e_2
e_7	e_5	e_6	e_4	$-e_3$	$-e_1$	$-e_2$	-1

split=1

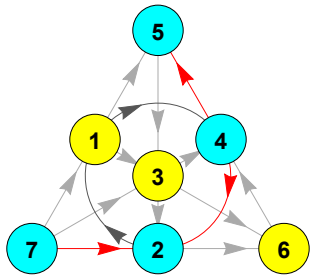
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	6	2	7	-3	-5
2	4	-1	-5	-1	3	7	-6
3	-6	5	1	7	2	-1	4
4	-2	1	-7	-1	6	-5	3
5	-7	-3	-2	-6	1	-4	-1
6	3	-7	1	5	4	1	-2
7	5	6	-4	-3	1	2	1

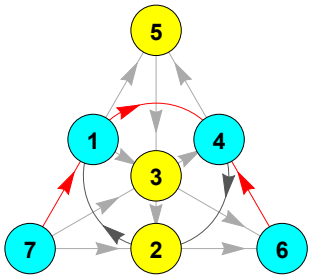
split=2

Fano plane



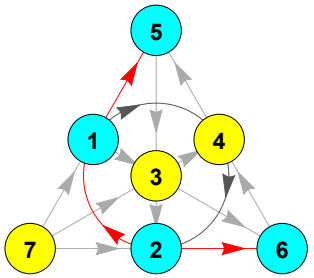
split=4

Fano plane



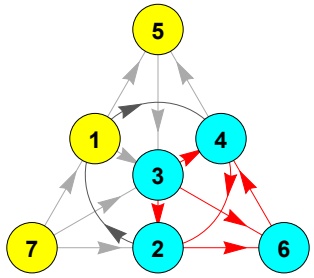
split=6

Fano plane



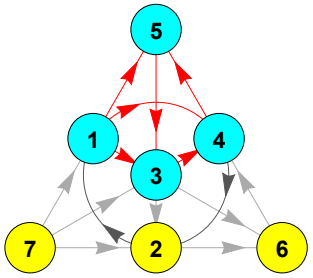
split=3

Fano plane



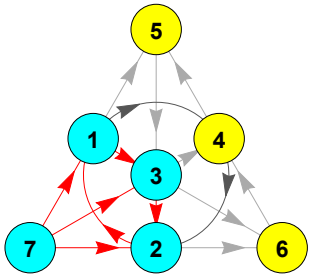
split=5

Fano plane



split=7

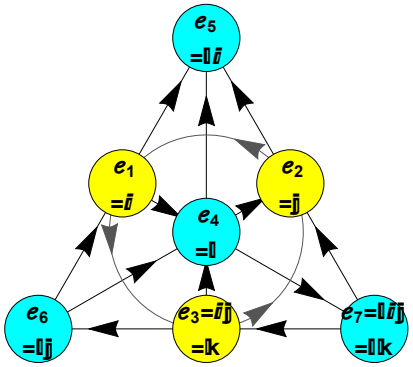
Fano plane



flip=True

{1, 3, 2}{1, 4, 7}{1, 5, 6}{2, 6, 4}{2, 5, 7}{3, 4, 5}{3, 6, 7}

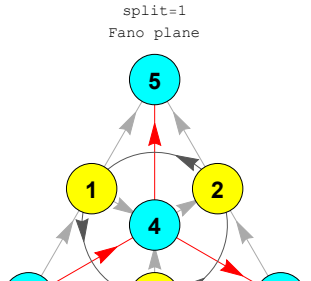
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	e_7	e_6	$-e_5$	$-e_4$
e_2	e_3	-1	$-e_1$	$-e_6$	e_7	e_4	$-e_5$
e_3	$-e_2$	e_1	-1	e_5	$-e_4$	e_7	$-e_6$
e_4	$-e_7$	e_6	$-e_5$	-1	e_3	$-e_2$	e_1
e_5	$-e_6$	$-e_7$	e_4	$-e_3$	-1	e_1	e_2
e_6	e_5	$-e_4$	$-e_7$	e_2	$-e_1$	-1	e_3
e_7	e_4	e_5	e_6	$-e_1$	$-e_2$	$-e_3$	-1

split=1

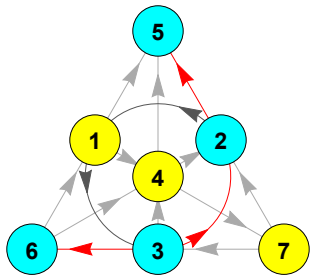
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	7	6	-5	-4
2	3	-1	-1	-6	7	4	-5
3	-2	1	-1	5	-4	7	-6
4	-7	6	-5	1	-3	2	-1
5	-6	-7	4	3	1	-1	-2
6	5	-4	-7	-2	1	1	-3
7	4	5	6	1	2	3	1

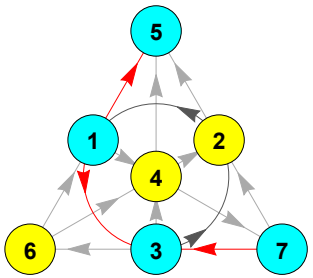
split=2

Fano plane



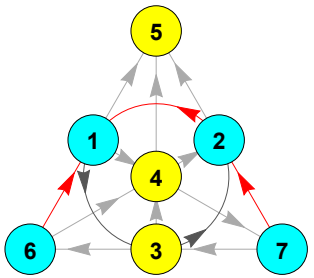
split=4

Fano plane



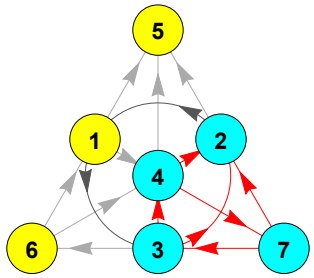
split=6

Fano plane



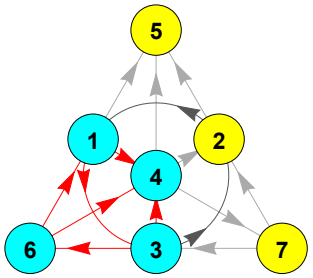
split=3

Fano plane



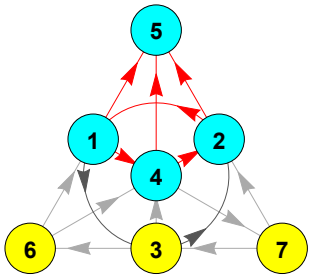
split=5

Fano plane



split=7

Fano plane

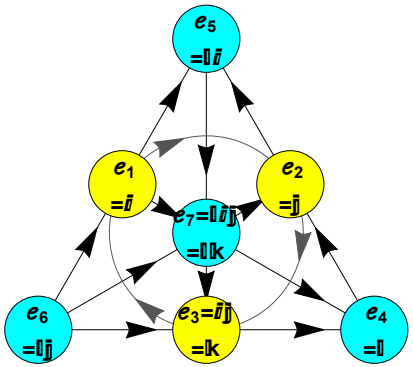


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates									Ele #
86	$\Phi_{c_d}^{X_2}{}^{0\to 1/3}_{\mathbb{L}}$		0apggsscc 000000010_2	Bn{ E8{	0 0	0 0	0 0	1 0	1 −1	0 0	0 1	1 0	} }	$\bar{F}$ 9

flip=False

{1, 2, 3}{1, 7, 4}{1, 5, 6}{2, 5, 4}{2, 6, 7}{3, 4, 6}{3, 5, 7}

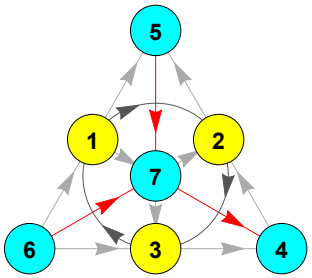
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	$-e_7$	e_6	$-e_5$	e_4
e_2	e_2	$-e_3$	−1	e_1	$-e_5$	e_4	e_7	$-e_6$
e_3	e_3	e_2	$-e_1$	−1	e_6	e_7	$-e_4$	$-e_5$
e_4	e_4	e_7	e_5	$-e_6$	−1	$-e_2$	e_3	$-e_1$
e_5	e_5	$-e_6$	$-e_4$	$-e_7$	e_2	−1	e_1	e_3
e_6	e_6	e_5	$-e_7$	e_4	$-e_3$	$-e_1$	−1	e_2
e_7	e_7	$-e_4$	e_6	e_5	e_1	$-e_3$	$-e_2$	−1

split=1

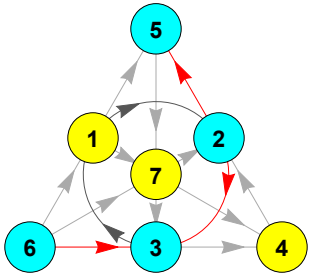
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−7	6	−5	4
2	−3	−1	1	−5	4	7	−6
3	2	−1	−1	6	7	−4	−5
4	7	5	−6	1	2	−3	1
5	−6	−4	−7	−2	1	−1	−3
6	5	−7	4	3	1	1	−2
7	−4	6	5	−1	3	2	1

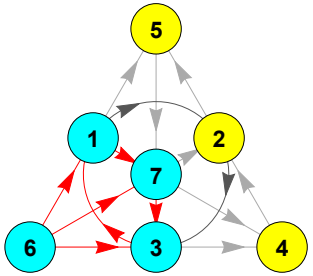
split=2

Fano plane



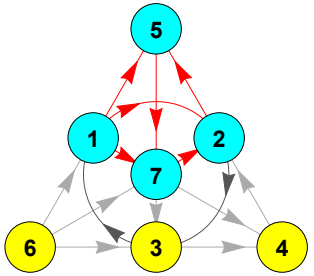
split=4

Fano plane



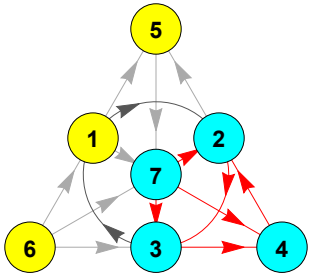
split=6

Fano plane



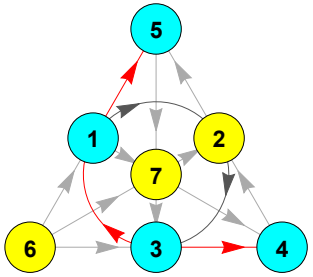
split=3

Fano plane



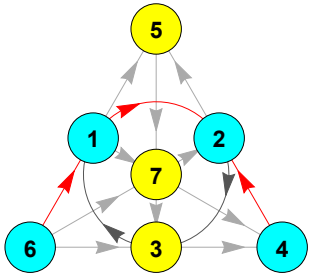
split=5

Fano plane



split=7

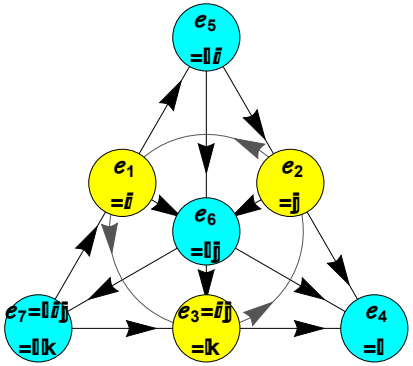
Fano plane



flip=True

{1, 3, 2}{1, 6, 4}{1, 5, 7}{2, 4, 5}{2, 6, 7}{3, 4, 7}{3, 5, 6}

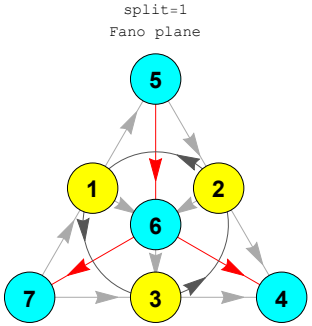
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	e_2	$-e_6$	e_7	e_4	$-e_5$
e_2	e_2	$-e_3$	−1	$-e_1$	e_5	$-e_4$	e_7	$-e_6$
e_3	e_3	$-e_2$	e_1	−1	e_7	e_6	$-e_5$	$-e_4$
e_4	e_6	$-e_5$	$-e_7$	−1	e_2	$-e_1$	e_3	
e_5	$-e_7$	e_4	$-e_6$	$-e_2$	−1	e_3	e_1	
e_6	$-e_4$	$-e_7$	e_5	e_1	$-e_3$	−1	e_2	
e_7	e_5	e_6	e_4	$-e_3$	$-e_1$	$-e_2$	−1	

split=1

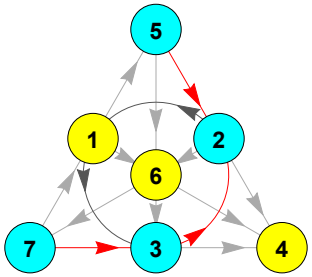
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−6	7	4	−5
2	3	−1	−1	5	−4	7	−6
3	−2	1	−1	7	6	−5	−4
4	6	−5	−7	1	−2	1	−3
5	−7	4	−6	2	1	−3	−1
6	−4	−7	5	−1	3	1	−2
7	5	6	4	3	1	2	1

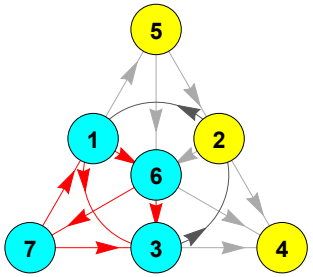
split=2

Fano plane



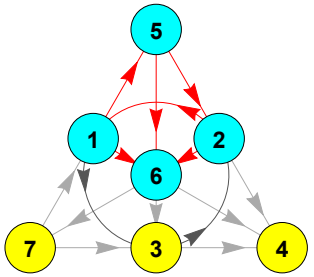
split=4

Fano plane



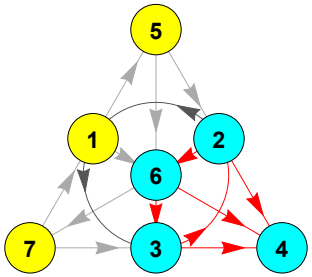
split=6

Fano plane



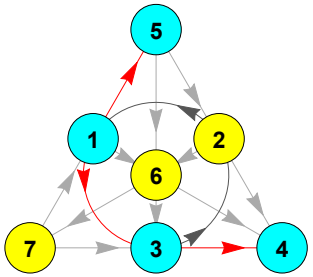
split=3

Fano plane



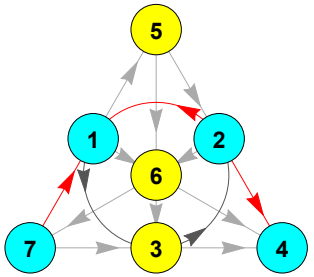
split=5

Fano plane



split=7

Fano plane

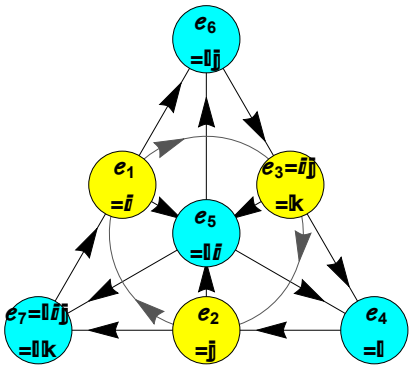


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
87	$\Phi_{x_1}^{0\to1/3}$		0apggsscc	Bn{	0	0	0	1	0	1	1	0 }	$\overline{He}$
			000000001_2	E8{	0	0	0	0	-1	1	0	0 }	2

flip=False

{1, 3, 2}{1, 5, 4}{1, 6, 7}{2, 7, 4}{2, 5, 6}{3, 4, 6}{3, 5, 7}

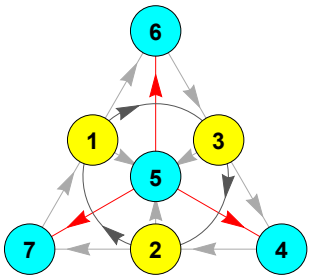
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_5$	e_4	e_7	$-e_6$
e_2	e_3	-1	$-e_1$	$-e_7$	e_6	$-e_5$	e_4
e_3	$-e_2$	e_1	-1	e_6	e_7	$-e_4$	$-e_5$
e_4	e_5	e_7	$-e_6$	-1	$-e_1$	e_3	$-e_2$
e_5	$-e_4$	$-e_6$	$-e_7$	e_1	-1	e_2	e_3
e_6	$-e_7$	e_5	e_4	$-e_3$	$-e_2$	-1	e_1
e_7	e_6	$-e_4$	e_5	e_2	$-e_3$	$-e_1$	-1

split=1

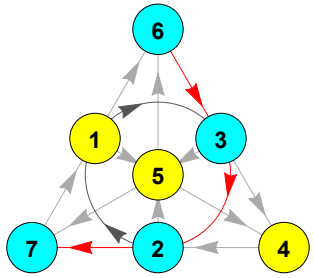
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-5	4	7	-6
2	3	-1	-1	-7	6	-5	4
3	-2	1	-1	6	7	-4	-5
4	5	7	-6	1	1	-3	2
5	-4	-6	-7	-1	1	-2	-3
6	-7	5	4	3	2	1	-1
7	6	-4	5	-2	3	1	1

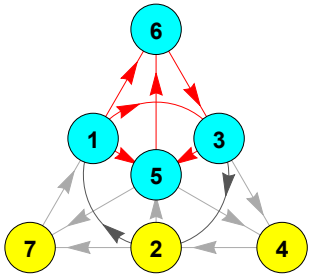
split=2

Fano plane



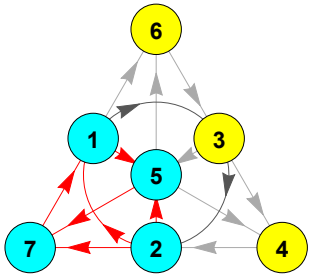
split=4

Fano plane



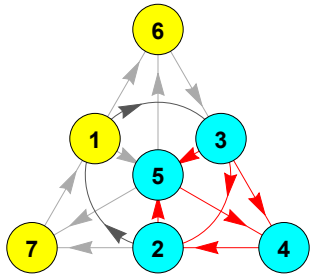
split=6

Fano plane



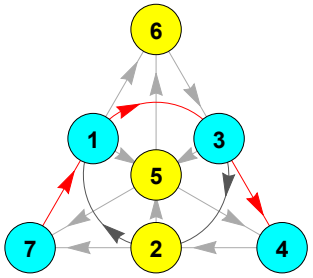
split=3

Fano plane



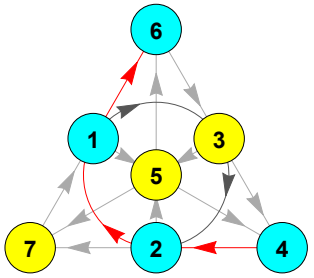
split=5

Fano plane



split=7

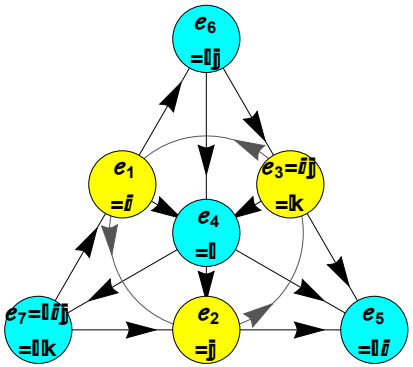
Fano plane



flip=True

{1, 2, 3}{1, 4, 5}{1, 6, 7}{2, 6, 4}{2, 5, 7}{3, 4, 7}{3, 5, 6}

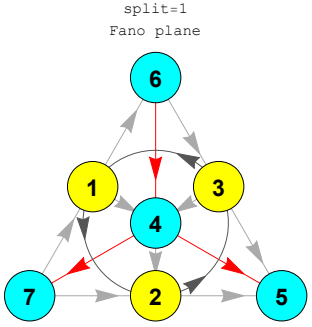
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_5	$-e_4$	e_7	$-e_6$
e_2	$-e_3$	-1	e_1	$-e_6$	e_7	e_4	$-e_5$
e_3	e_2	$-e_1$	-1	e_7	e_6	$-e_5$	$-e_4$
e_4	$-e_5$	e_6	$-e_7$	-1	e_1	$-e_2$	e_3
e_5	e_4	$-e_7$	$-e_6$	$-e_1$	-1	e_3	e_2
e_6	$-e_7$	$-e_4$	e_5	e_2	$-e_3$	-1	e_1
e_7	e_6	e_5	e_4	$-e_3$	$-e_2$	$-e_1$	-1

split=1

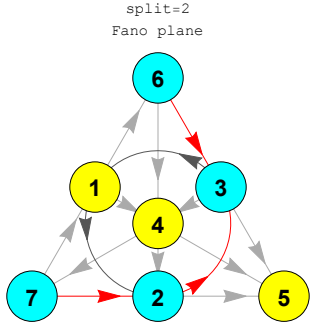
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	5	-4	7	-6
2	-3	-1	1	-6	7	4	-5
3	2	-1	-1	7	6	-5	-4
4	-5	6	-7	1	-1	2	-3
5	4	-7	-6	1	1	-3	-2
6	-7	-4	5	-2	3	1	-1
7	6	5	4	3	2	1	1

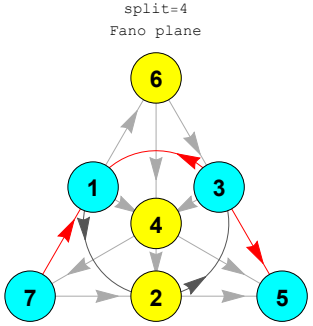
split=2

Fano plane



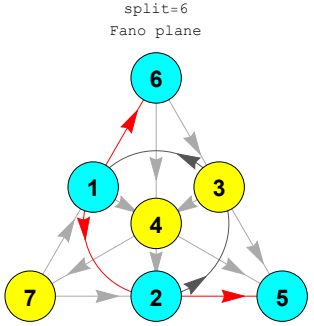
split=4

Fano plane



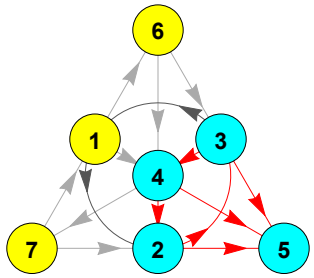
split=6

Fano plane



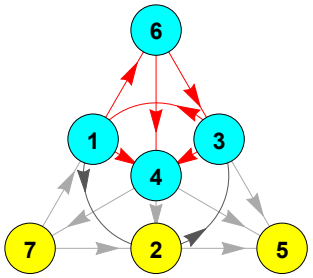
split=3

Fano plane



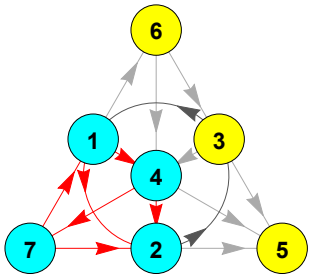
split=5

Fano plane



split=7

Fano plane

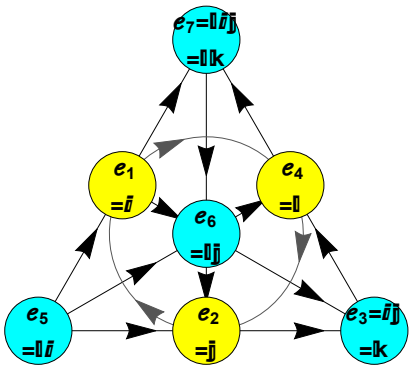


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates									Ele #
88	Φx_3 m_1 $^{0\mapsto -2/3}_{R}$			0apggsscc 000000111$_2$	Bn{ E8{	0 0	0 0	0 0	1 0	0 0	1 -1	0 -1	1 0	} }	$\overline{\overline{Li}}$ 3

flip=False

{1, 4, 2}{1, 6, 3}{1, 7, 5}{2, 3, 5}{2, 7, 6}{3, 4, 7}{4, 5, 6}

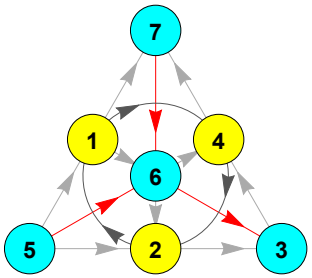
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_4$	$-e_6$	e_2	$-e_7$	e_3	e_5
e_2	e_4	-1	e_5	$-e_1$	$-e_3$	$-e_7$	e_6
e_3	e_6	$-e_5$	-1	e_7	e_2	$-e_1$	$-e_4$
e_4	$-e_2$	e_1	$-e_7$	-1	e_6	$-e_5$	e_3
e_5	e_7	e_3	$-e_2$	$-e_6$	-1	e_4	$-e_1$
e_6	$-e_3$	e_7	e_1	e_5	$-e_4$	-1	$-e_2$
e_7	$-e_5$	$-e_6$	e_4	$-e_3$	e_1	e_2	-1

split=1

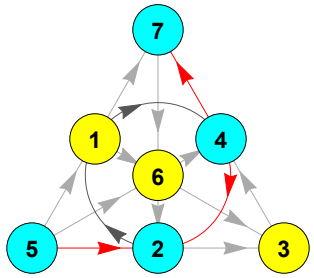
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	-6	2	-7	3	5
2	4	-1	5	-1	-3	-7	6
3	6	-5	1	7	-2	1	4
4	-2	1	-7	-1	6	-5	3
5	7	3	2	-6	1	-4	1
6	-3	7	-1	5	4	1	2
7	-5	-6	-4	-3	-1	-2	1

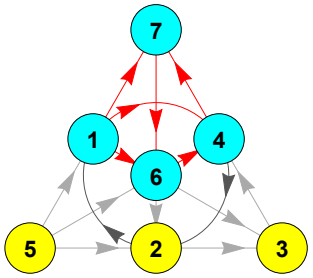
split=2

Fano plane



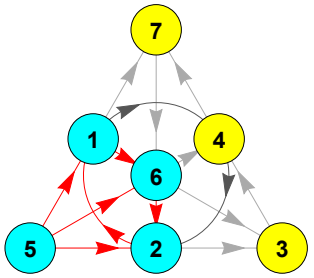
split=4

Fano plane



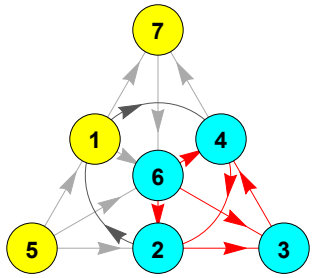
split=6

Fano plane



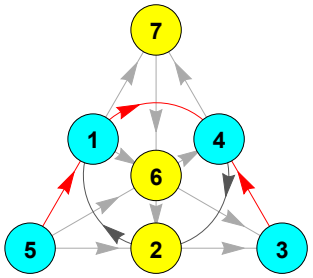
split=3

Fano plane



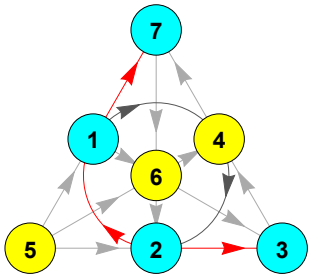
split=5

Fano plane



split=7

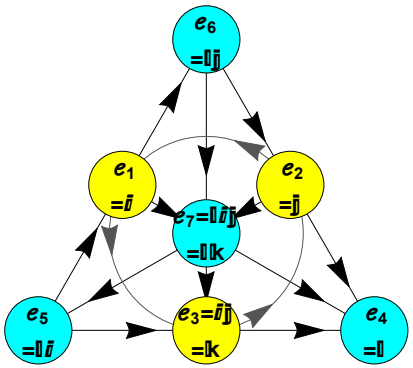
Fano plane



flip=True

{1, 3, 2}{1, 7, 4}{1, 6, 5}{2, 4, 6}{2, 7, 5}{3, 4, 5}{3, 6, 7}

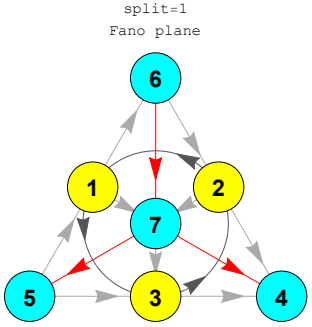
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_7$	$-e_6$	e_5	e_4
e_2	e_3	-1	$-e_1$	e_6	$-e_7$	$-e_4$	e_5
e_3	$-e_2$	e_1	-1	e_5	$-e_4$	e_7	$-e_6$
e_4	e_7	$-e_6$	$-e_5$	-1	e_3	e_2	$-e_1$
e_5	e_6	e_7	e_4	$-e_3$	-1	$-e_1$	$-e_2$
e_6	$-e_5$	e_4	$-e_7$	$-e_2$	e_1	-1	e_3
e_7	$-e_4$	$-e_5$	e_6	e_1	e_2	$-e_3$	-1

split=1

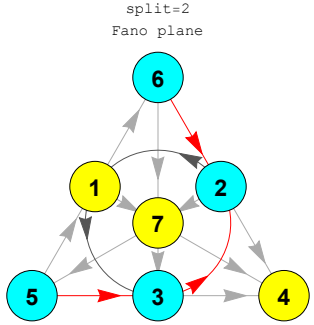
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-7	-6	5	4
2	3	-1	-1	6	-7	-4	5
3	-2	1	-1	5	-4	7	-6
4	7	-6	-5	1	-3	-2	1
5	6	7	4	3	1	1	2
6	-5	4	-7	2	-1	1	-3
7	-4	-5	6	-1	-2	3	1

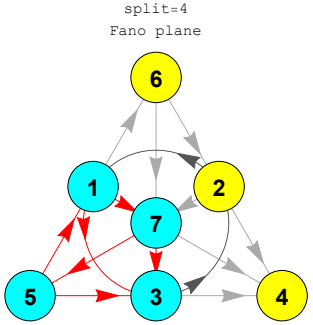
split=2

Fano plane



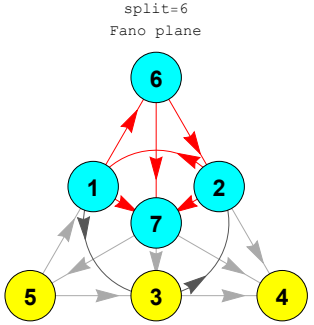
split=4

Fano plane



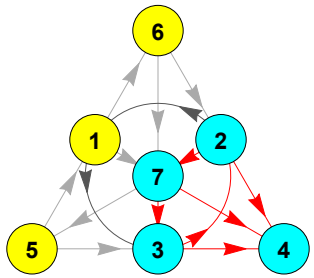
split=6

Fano plane



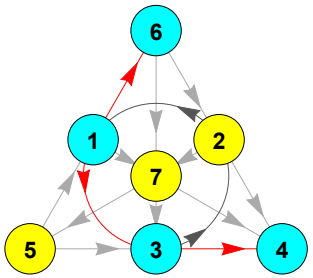
split=3

Fano plane



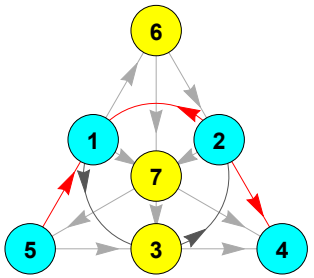
split=5

Fano plane



split=7

Fano plane

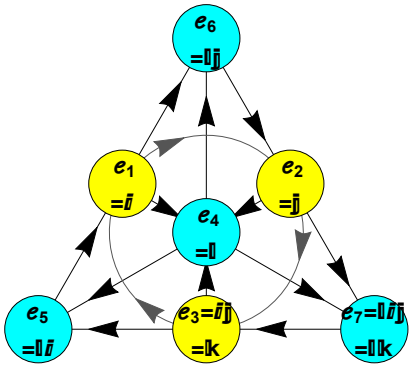


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
89	$\Phi_{X_2}^{c_1}$ $0\mapsto -2/3$		0apggsscc	Bn{	0	0	0	1	0	0	1	1	}	Cn
			000000110_2	E8{	0	0	0	0	0	−1	0	−1	}	112

flip=False

{1, 2, 3}{1, 4, 7}{1, 6, 5}{2, 4, 5}{2, 7, 6}{3, 4, 6}{3, 5, 7}

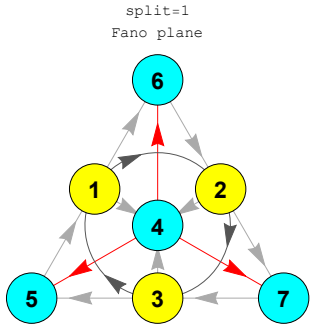
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	e_7	$-e_6$	e_5	$-e_4$
e_2	$-e_3$	−1	e_1	e_5	$-e_4$	$-e_7$	e_6
e_3	e_2	$-e_1$	−1	e_6	e_7	$-e_4$	$-e_5$
e_4	$-e_7$	$-e_5$	$-e_6$	−1	e_2	e_3	e_1
e_5	e_6	e_4	$-e_7$	$-e_2$	−1	$-e_1$	e_3
e_6	$-e_5$	e_7	e_4	$-e_3$	e_1	−1	$-e_2$
e_7	e_4	$-e_6$	e_5	$-e_1$	$-e_3$	e_2	−1

split=1

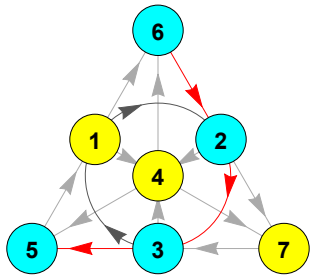
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	7	−6	5	−4
2	−3	−1	1	5	−4	−7	6
3	2	−1	−1	6	7	−4	−5
4	−7	−5	−6	1	−2	−3	−1
5	6	4	−7	2	1	1	−3
6	−5	7	4	3	−1	1	2
7	4	−6	5	1	3	−2	1

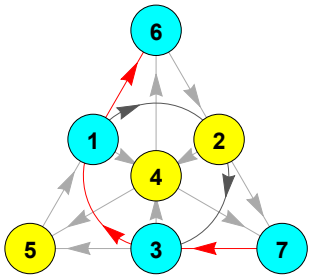
split=2

Fano plane



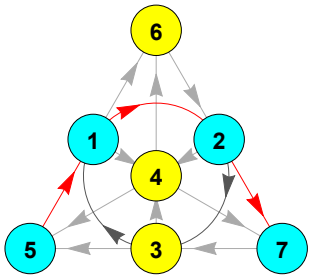
split=4

Fano plane



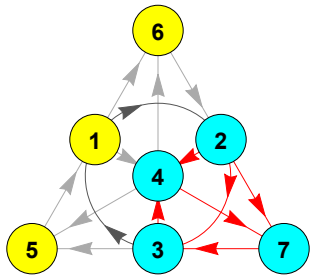
split=6

Fano plane



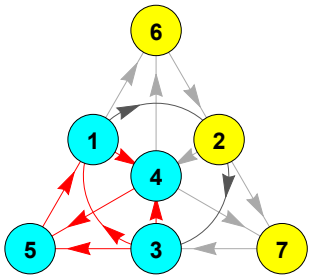
split=3

Fano plane



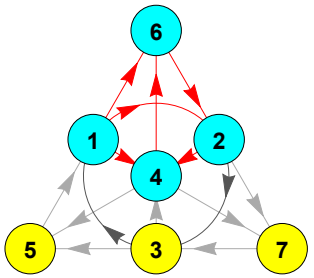
split=5

Fano plane



split=7

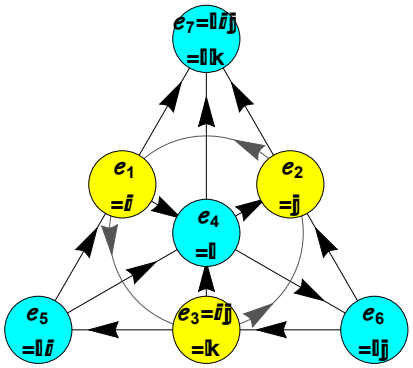
Fano plane



flip=True

{1, 3, 2}{1, 4, 6}{1, 7, 5}{2, 5, 4}{2, 7, 6}{3, 4, 7}{3, 5, 6}

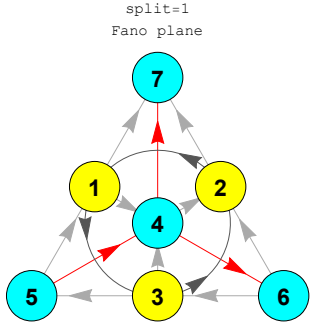
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	e_6	$-e_7$	$-e_4$	e_5
e_2	e_3	−1	$-e_1$	$-e_5$	e_4	$-e_7$	e_6
e_3	$-e_2$	e_1	−1	e_7	e_6	$-e_5$	$-e_4$
e_4	$-e_6$	e_5	$-e_7$	−1	$-e_2$	e_1	e_3
e_5	e_7	$-e_4$	$-e_6$	e_2	−1	e_3	$-e_1$
e_6	e_4	e_7	e_5	$-e_1$	$-e_3$	−1	$-e_2$
e_7	$-e_5$	$-e_6$	e_4	$-e_3$	e_1	e_2	−1

split=1

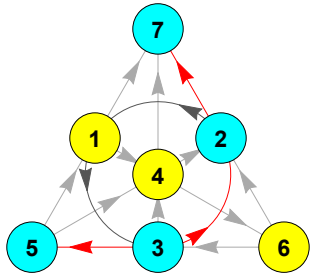
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	6	−7	−4	5
2	3	−1	−1	−5	4	−7	6
3	−2	1	−1	7	6	−5	−4
4	−6	5	−7	1	2	−1	−3
5	7	−4	−6	−2	1	−3	1
6	4	7	5	1	3	1	2
7	−5	−6	4	3	−1	−2	1

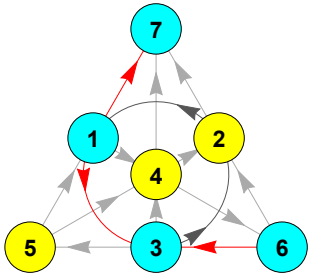
split=2

Fano plane



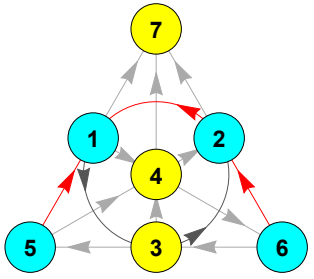
split=4

Fano plane



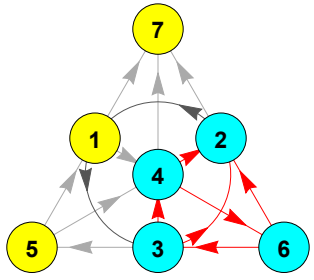
split=6

Fano plane



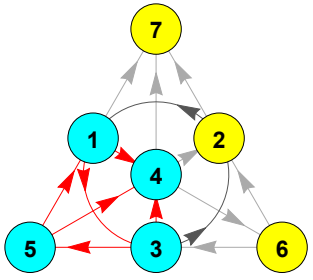
split=3

Fano plane



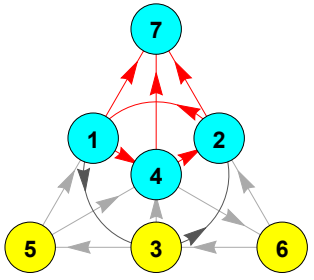
split=5

Fano plane



split=7

Fano plane

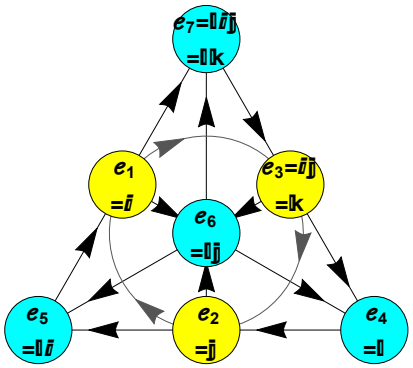


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
90	$\overline{g^{rb}_{cm}}$ $^{0}_{R}$		0apggsscc 010001110_2	Bn{ 0 0 0 0 1 1 1 0 } E8{ 0 0 0 0 0 -1 0 1 }	$\overline{Uup}$ 115

flip=False

{1, 3, 2}{1, 6, 4}{1, 7, 5}{2, 5, 4}{2, 6, 7}{3, 4, 7}{3, 6, 5}

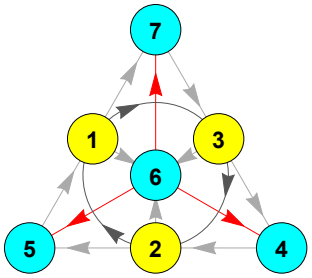
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_6$	$-e_7$	e_4	e_5
e_2	e_3	-1	$-e_1$	$-e_5$	e_4	e_7	$-e_6$
e_3	$-e_2$	e_1	-1	e_7	$-e_6$	e_5	$-e_4$
e_4	e_6	e_5	$-e_7$	-1	$-e_2$	$-e_1$	e_3
e_5	e_7	$-e_4$	e_6	e_2	-1	$-e_3$	$-e_1$
e_6	$-e_4$	$-e_7$	$-e_5$	e_1	e_3	-1	e_2
e_7	$-e_5$	e_6	e_4	$-e_3$	e_1	$-e_2$	-1

split=1

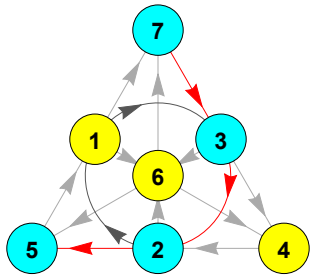
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-6	-7	4	5
2	3	-1	-1	-5	4	7	-6
3	-2	1	-1	7	-6	5	-4
4	6	5	-7	1	2	1	-3
5	7	-4	6	-2	1	3	1
6	-4	-7	-5	-1	-3	1	-2
7	-5	6	4	3	-1	2	1

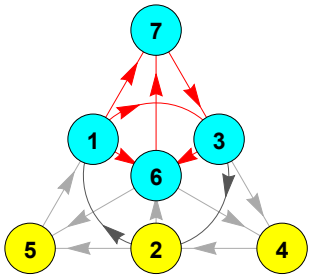
split=2

Fano plane



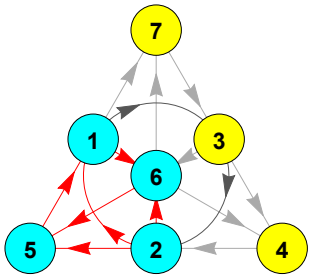
split=4

Fano plane



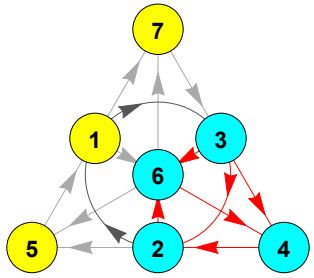
split=6

Fano plane



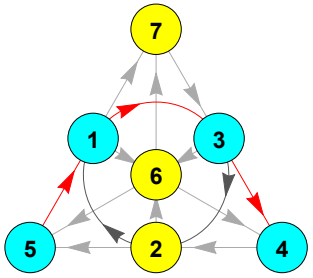
split=3

Fano plane



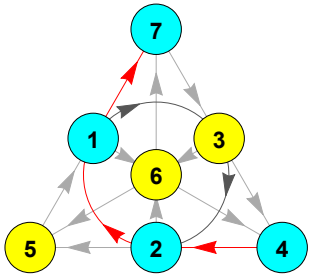
split=5

Fano plane



split=7

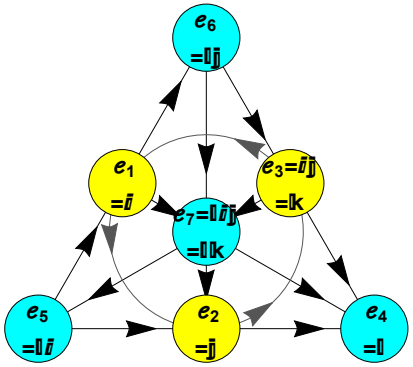
Fano plane



flip=True

{1, 2, 3}{1, 7, 4}{1, 6, 5}{2, 4, 5}{2, 6, 7}{3, 4, 6}{3, 7, 5}

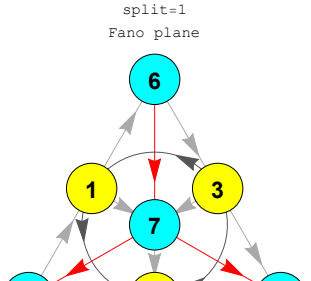
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	$-e_7$	$-e_6$	e_5	e_4
e_2	$-e_3$	-1	e_1	e_5	$-e_4$	e_7	$-e_6$
e_3	e_2	$-e_1$	-1	e_6	$-e_7$	$-e_4$	e_5
e_4	e_7	$-e_5$	$-e_6$	-1	e_2	e_3	$-e_1$
e_5	e_6	e_4	e_7	$-e_2$	-1	$-e_1$	$-e_3$
e_6	$-e_5$	$-e_7$	e_4	$-e_3$	e_1	-1	e_2
e_7	$-e_4$	e_6	$-e_5$	e_1	e_3	$-e_2$	-1

split=1

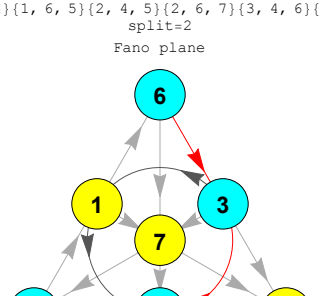
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	-7	-6	5	4
2	-3	-1	1	5	-4	7	-6
3	2	-1	-1	6	-7	-4	5
4	7	-5	-6	1	-2	-3	1
5	6	4	7	2	1	1	3
6	-5	-7	4	3	-1	1	-2
7	-4	6	-5	-1	-3	2	1

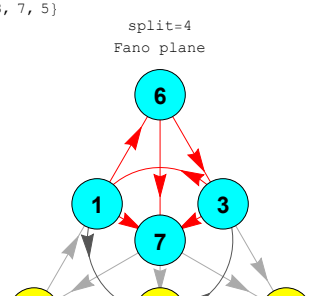
split=2

Fano plane



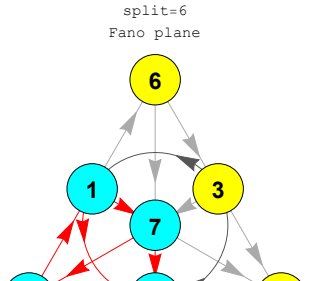
split=4

Fano plane



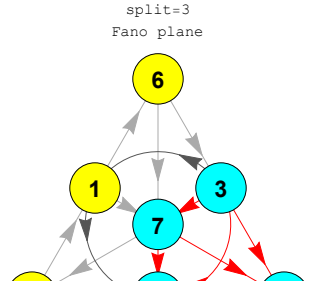
split=6

Fano plane



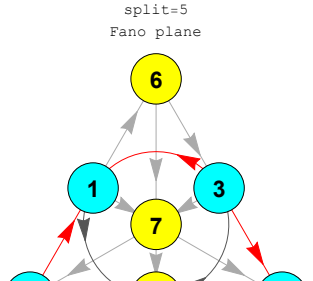
split=3

Fano plane



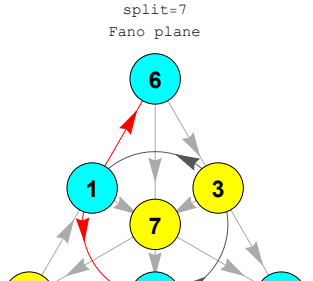
split=5

Fano plane



split=7

Fano plane



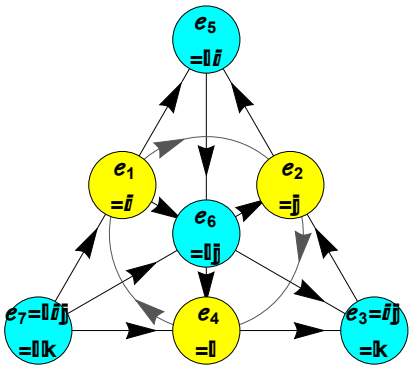
Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #

Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
91	$g^{rg}_{m_m}$ $^{0}_{R}$		0apggsscc	Bn{	0	0	0	0	1	1	0	1	}	$\overline{H}$
			000001111$_2$	E8{	0	0	0	0	0	-1	1	0	}	1

flip=False

{1, 2, 4}{1, 6, 3}{1, 5, 7}{2, 5, 3}{2, 7, 6}{3, 7, 4}{4, 5, 6}

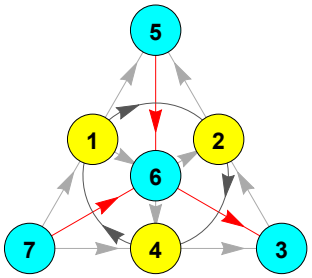
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_4	$-e_6$	$-e_2$	e_7	e_3	$-e_5$
e_2	$-e_4$	-1	$-e_5$	e_1	e_3	$-e_7$	e_6
e_3	e_6	e_5	-1	$-e_7$	$-e_2$	$-e_1$	e_4
e_4	e_2	$-e_1$	e_7	-1	e_6	$-e_5$	$-e_3$
e_5	$-e_7$	$-e_3$	e_2	$-e_6$	-1	e_4	e_1
e_6	$-e_3$	e_7	e_1	e_5	$-e_4$	-1	$-e_2$
e_7	e_5	$-e_6$	$-e_4$	e_3	$-e_1$	e_2	-1

split=1

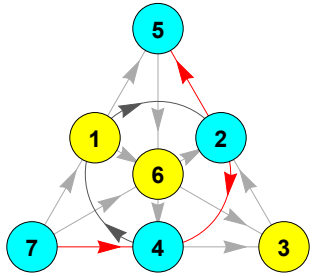
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	4	-6	-2	7	3	-5
2	-4	-1	-5	1	3	-7	6
3	6	5	1	-7	2	1	-4
4	2	-1	7	-1	6	-5	-3
5	-7	-3	-2	-6	1	-4	-1
6	-3	7	-1	5	4	1	2
7	5	-6	4	3	1	-2	1

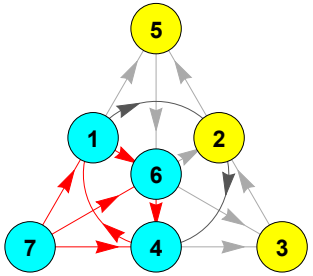
split=2

Fano plane



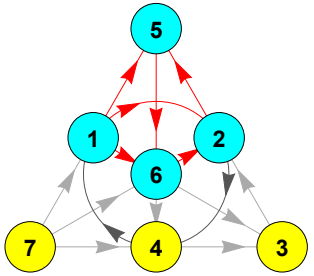
split=4

Fano plane



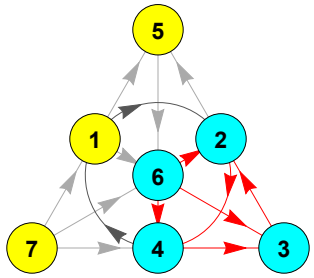
split=6

Fano plane



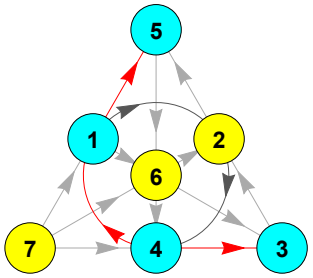
split=3

Fano plane



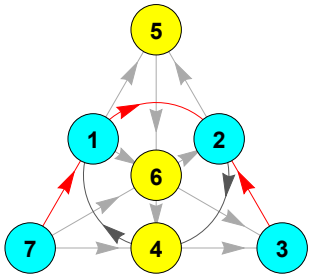
split=5

Fano plane



split=7

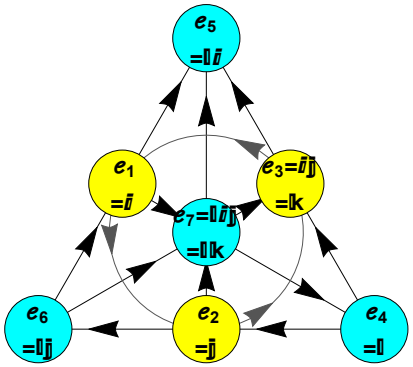
Fano plane



flip=True

{1, 2, 3}{1, 7, 4}{1, 5, 6}{2, 6, 4}{2, 7, 5}{3, 5, 4}{3, 6, 7}

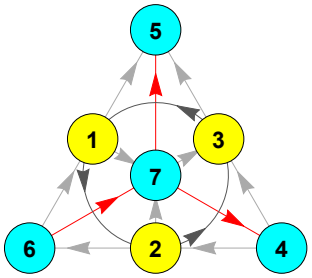
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	$-e_7$	e_6	$-e_5$	e_4
e_2	$-e_3$	-1	e_1	$-e_6$	$-e_7$	e_4	e_5
e_3	e_2	$-e_1$	-1	$-e_5$	e_4	e_7	$-e_6$
e_4	e_7	e_6	e_5	-1	$-e_3$	$-e_2$	$-e_1$
e_5	$-e_6$	e_7	$-e_4$	e_3	-1	e_1	$-e_2$
e_6	e_5	$-e_4$	$-e_7$	e_2	$-e_1$	-1	e_3
e_7	$-e_4$	$-e_5$	e_6	e_1	e_2	$-e_3$	-1

split=1

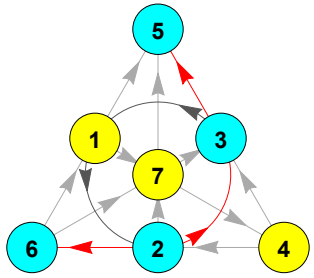
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	-7	6	-5	4
2	-3	-1	1	-6	-7	4	5
3	2	-1	-1	-5	4	7	-6
4	7	6	5	1	3	2	1
5	-6	7	-4	-3	1	-1	2
6	5	-4	-7	-2	1	1	-3
7	-4	-5	6	-1	-2	3	1

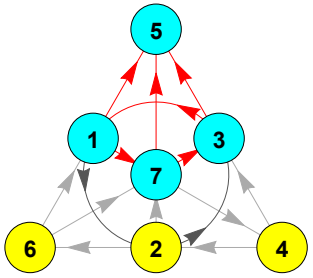
split=2

Fano plane



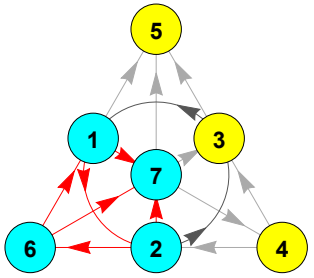
split=4

Fano plane



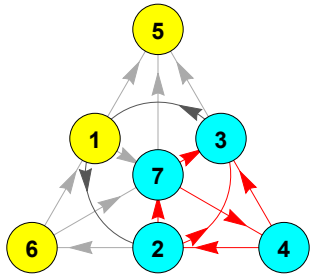
split=6

Fano plane



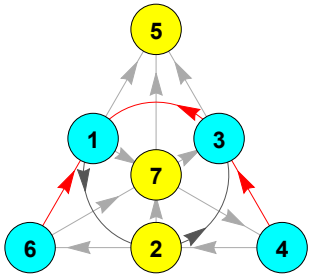
split=3

Fano plane



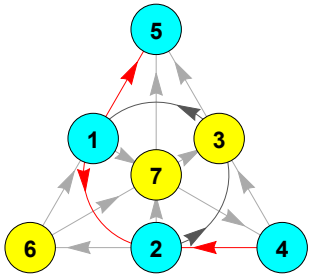
split=5

Fano plane



split=7

Fano plane

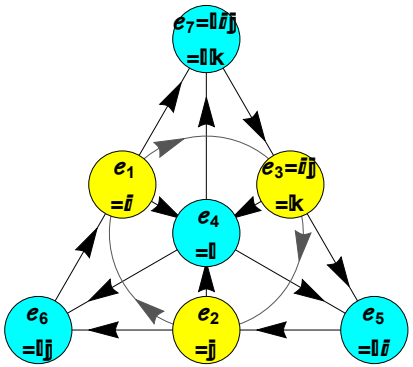


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
92	Φx_1		0apggsscc	Bn{	0	0	0	0	1	0	1	1	}	Uut
	$\circ_1$		000000101_2	E8{	0	0	0	0	0	0	−1	−1	}	113

flip=False

{1, 3, 2}{1, 4, 5}{1, 7, 6}{2, 4, 7}{2, 6, 5}{3, 4, 6}{3, 5, 7}

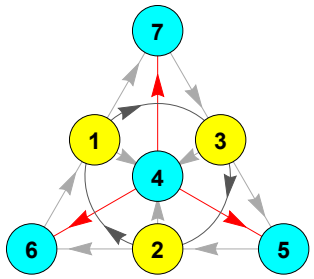
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	e_5	$-e_4$	$-e_7$	e_6
e_2	e_3	−1	$-e_1$	e_7	$-e_6$	e_5	$-e_4$
e_3	$-e_2$	e_1	−1	e_6	e_7	$-e_4$	$-e_5$
e_4	$-e_5$	$-e_7$	$-e_6$	−1	e_1	e_3	e_2
e_5	e_4	e_6	$-e_7$	$-e_1$	−1	$-e_2$	e_3
e_6	e_7	$-e_5$	e_4	$-e_3$	e_2	−1	$-e_1$
e_7	$-e_6$	e_4	e_5	$-e_2$	$-e_3$	e_1	−1

split=1

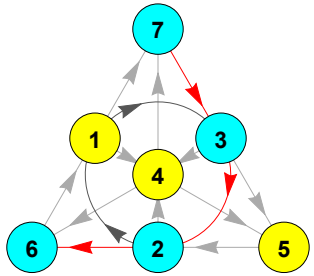
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	5	−4	−7	6
2	3	−1	−1	7	−6	5	−4
3	−2	1	−1	6	7	−4	−5
4	−5	−7	−6	1	−1	−3	−2
5	4	6	−7	1	1	2	−3
6	7	−5	4	3	−2	1	1
7	−6	4	5	2	3	−1	1

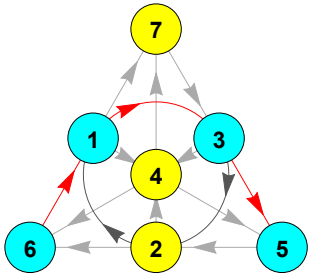
split=2

Fano plane



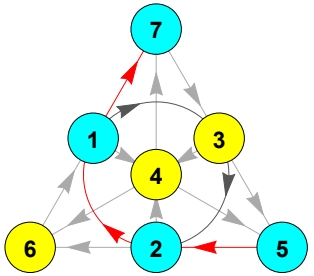
split=4

Fano plane



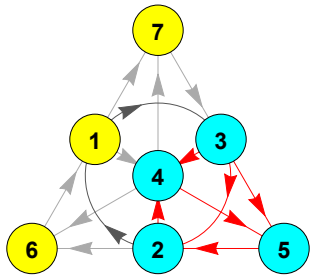
split=6

Fano plane



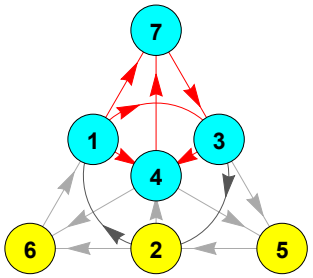
split=3

Fano plane



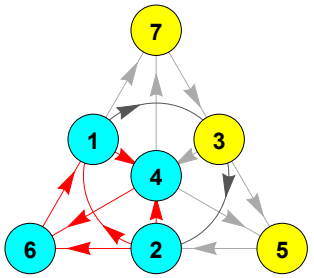
split=5

Fano plane



split=7

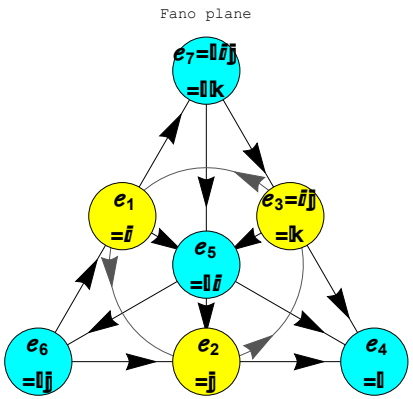
Fano plane



flip=True

{1, 2, 3}{1, 5, 4}{1, 7, 6}{2, 4, 6}{2, 7, 5}{3, 4, 7}{3, 5, 6}

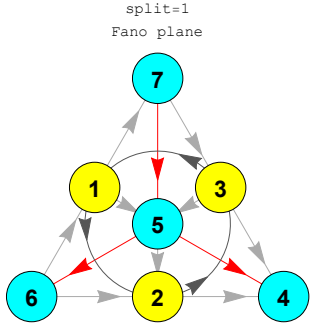
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	$-e_5$	e_4	$-e_7$	e_6
e_2	$-e_3$	−1	e_1	e_6	$-e_7$	$-e_4$	e_5
e_3	e_2	$-e_1$	−1	e_7	e_6	$-e_5$	$-e_4$
e_4	e_5	$-e_6$	$-e_7$	−1	$-e_1$	e_2	e_3
e_5	$-e_4$	e_7	$-e_6$	e_1	−1	e_3	$-e_2$
e_6	e_7	e_4	e_5	$-e_2$	$-e_3$	−1	$-e_1$
e_7	$-e_6$	$-e_5$	e_4	$-e_3$	e_2	e_1	−1

split=1

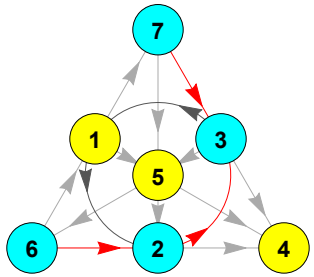
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−5	4	−7	6
2	−3	−1	1	6	−7	−4	5
3	2	−1	−1	7	6	−5	−4
4	5	−6	−7	1	1	−2	−3
5	−4	7	−6	−1	1	−3	2
6	7	4	5	2	3	1	1
7	−6	−5	4	3	−2	−1	1

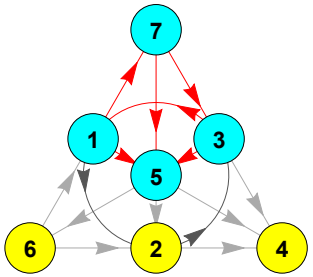
split=2

Fano plane



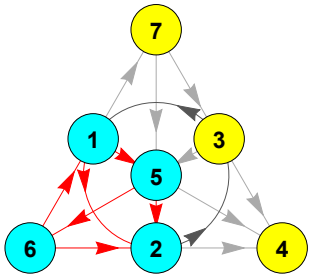
split=4

Fano plane



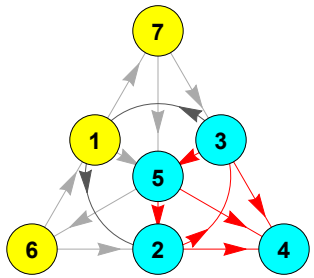
split=6

Fano plane



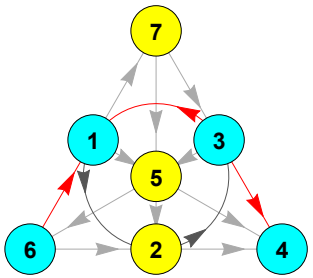
split=3

Fano plane



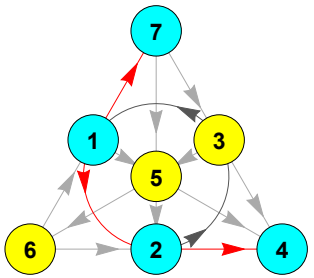
split=5

Fano plane



split=7

Fano plane

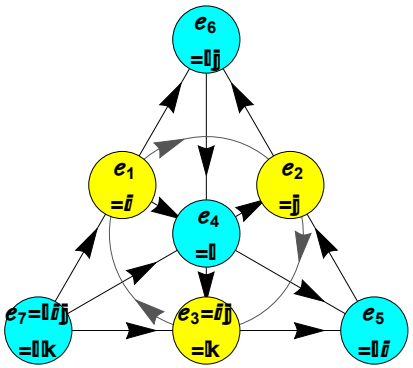


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates									Ele #
93	g^{gb}_{Om}		0apggsscc	Bn{	0	0	0	0	0	1	1	1	}	$\overline{F1}$
			000001101_2	E8{	0	0	0	0	0	0	-1	1	}	114

flip=False

{1, 2, 3}{1, 4, 5}{1, 6, 7}{2, 7, 4}{2, 6, 5}{3, 6, 4}{3, 5, 7}

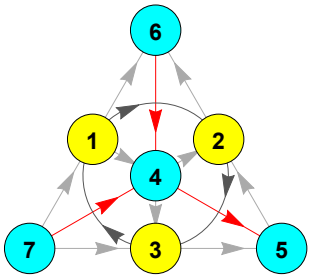
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_5	$-e_4$	e_7	$-e_6$
e_2	$-e_3$	-1	e_1	$-e_7$	$-e_6$	e_5	e_4
e_3	e_2	$-e_1$	-1	$-e_6$	e_7	e_4	$-e_5$
e_4	$-e_5$	e_7	e_6	-1	e_1	$-e_3$	$-e_2$
e_5	e_4	e_6	$-e_7$	$-e_1$	-1	$-e_2$	e_3
e_6	$-e_7$	$-e_5$	$-e_4$	e_3	e_2	-1	e_1
e_7	e_6	$-e_4$	e_5	e_2	$-e_3$	$-e_1$	-1

split=1

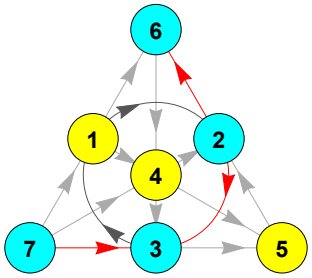
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	5	-4	7	-6
2	-3	-1	1	-7	-6	5	4
3	2	-1	-1	-6	7	4	-5
4	-5	7	6	1	-1	3	2
5	4	6	-7	1	1	2	-3
6	-7	-5	-4	-3	-2	1	-1
7	6	-4	5	-2	3	1	1

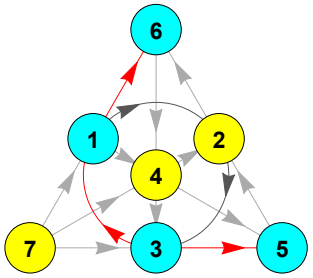
split=2

Fano plane



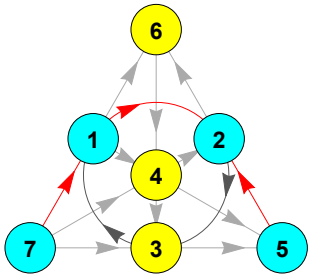
split=4

Fano plane



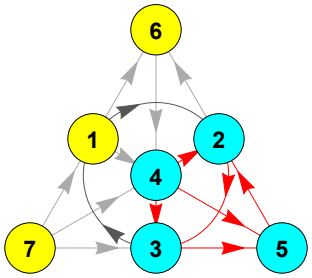
split=6

Fano plane



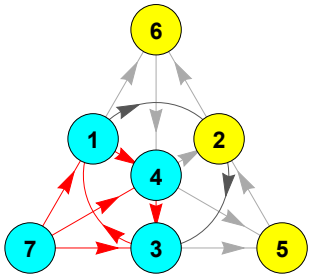
split=3

Fano plane



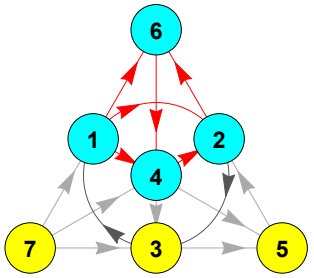
split=5

Fano plane



split=7

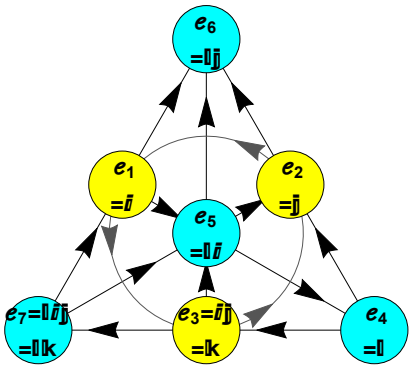
Fano plane



flip=True

{1, 3, 2}{1, 5, 4}{1, 6, 7}{2, 6, 4}{2, 7, 5}{3, 7, 4}{3, 5, 6}

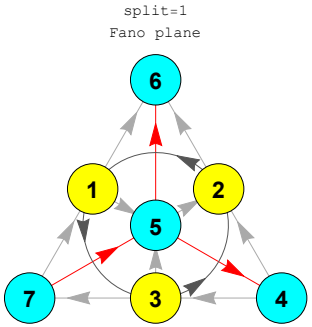
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_5$	e_4	e_7	$-e_6$
e_2	e_3	-1	$-e_1$	$-e_6$	$-e_7$	e_4	e_5
e_3	$-e_2$	e_1	-1	$-e_7$	e_6	$-e_5$	e_4
e_4	e_5	e_6	e_7	-1	$-e_1$	$-e_2$	$-e_3$
e_5	$-e_4$	e_7	$-e_6$	e_1	-1	e_3	$-e_2$
e_6	$-e_7$	$-e_4$	e_5	e_2	$-e_3$	-1	e_1
e_7	e_6	$-e_5$	$-e_4$	e_3	e_2	$-e_1$	-1

split=1

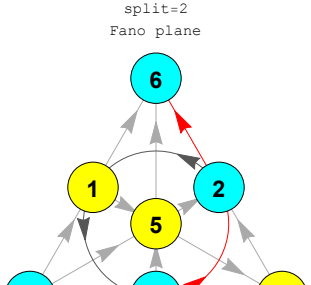
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-5	4	7	-6
2	3	-1	-1	-6	-7	4	5
3	-2	1	-1	-7	6	-5	4
4	5	6	7	1	1	2	3
5	-4	7	-6	-1	1	-3	2
6	-7	-4	5	-2	3	1	-1
7	6	-5	-4	-3	-2	1	1

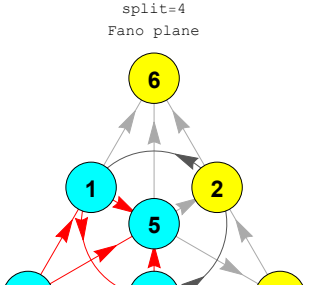
split=2

Fano plane



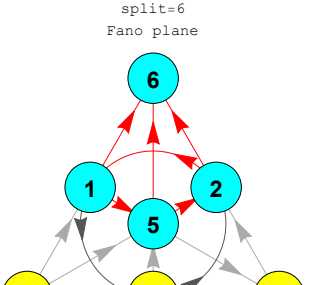
split=4

Fano plane



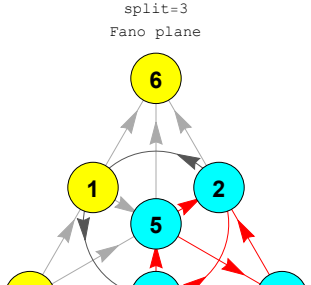
split=6

Fano plane



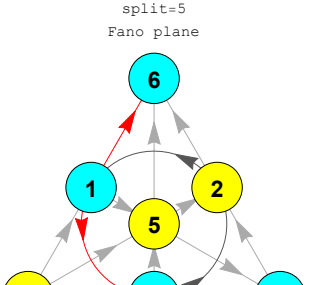
split=3

Fano plane



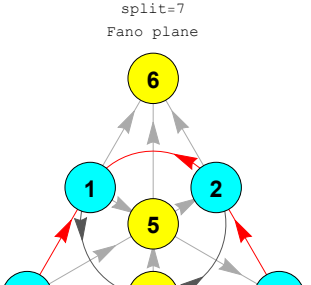
split=5

Fano plane



split=7

Fano plane

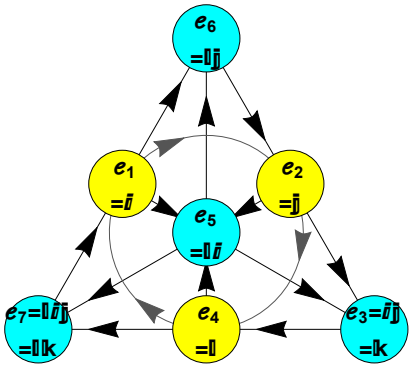


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates	Ele #
94	e_{y_d}		0apggsscc 000010000_2		Bn{ 1 1 1 1 0 0 0 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Sg 106

flip=False

{1, 2, 4}{1, 5, 3}{1, 6, 7}{2, 3, 6}{2, 5, 7}{3, 4, 7}{4, 5, 6}

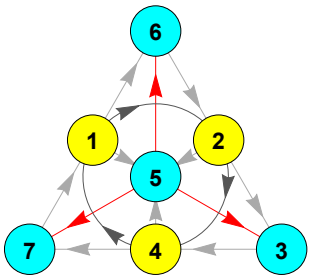
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_5$	$-e_2$	e_3	e_7	$-e_6$
e_2	$-e_4$	−1	e_6	e_1	e_7	$-e_3$	$-e_5$
e_3	e_5	$-e_6$	−1	e_7	$-e_1$	e_2	$-e_4$
e_4	e_2	$-e_1$	$-e_7$	−1	e_6	$-e_5$	e_3
e_5	$-e_3$	$-e_7$	e_1	$-e_6$	−1	e_4	e_2
e_6	$-e_7$	e_3	$-e_2$	e_5	$-e_4$	−1	e_1
e_7	e_6	e_5	e_4	$-e_3$	$-e_2$	$-e_1$	−1

split=1

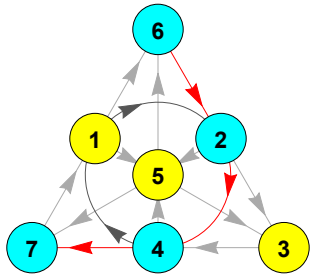
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−5	−2	3	7	−6
2	−4	−1	6	1	7	−3	−5
3	5	−6	1	7	1	−2	4
4	2	−1	−7	−1	6	−5	3
5	−3	−7	−1	−6	1	−4	−2
6	−7	3	2	5	4	1	−1
7	6	5	−4	−3	2	1	1

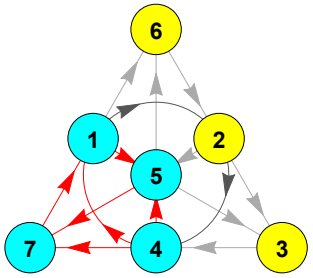
split=2

Fano plane



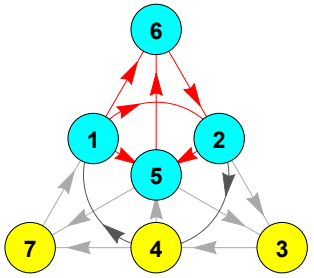
split=4

Fano plane



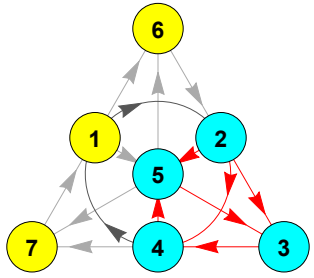
split=6

Fano plane



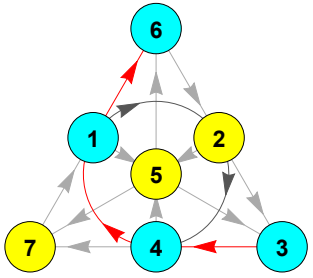
split=3

Fano plane



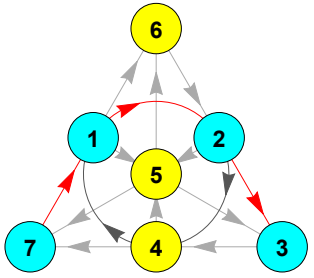
split=5

Fano plane



split=7

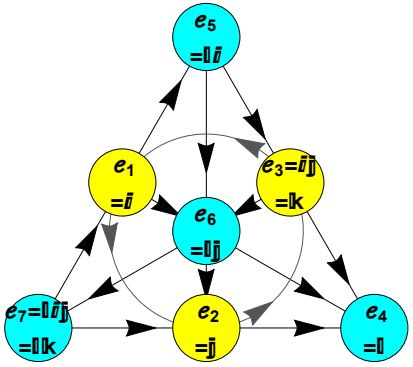
Fano plane



flip=True

{1, 2, 3}{1, 6, 4}{1, 5, 7}{2, 4, 7}{2, 5, 6}{3, 4, 5}{3, 6, 7}

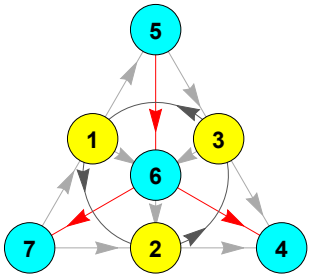
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	$-e_6$	e_7	e_4	$-e_5$
e_2	$-e_3$	−1	e_1	e_7	e_6	$-e_5$	$-e_4$
e_3	e_2	$-e_1$	−1	e_5	$-e_4$	e_7	$-e_6$
e_4	e_6	$-e_7$	$-e_5$	−1	e_3	$-e_1$	e_2
e_5	$-e_7$	$-e_6$	e_4	$-e_3$	−1	e_2	e_1
e_6	$-e_4$	e_5	$-e_7$	e_1	$-e_2$	−1	e_3
e_7	e_5	e_4	e_6	$-e_2$	$-e_1$	$-e_3$	−1

split=1

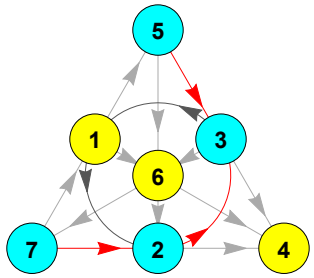
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−6	7	4	−5
2	−3	−1	1	7	6	−5	−4
3	2	−1	−1	5	−4	7	−6
4	6	−7	−5	1	−3	1	−2
5	−7	−6	4	3	1	−2	−1
6	−4	5	−7	−1	2	1	−3
7	5	4	6	2	1	3	1

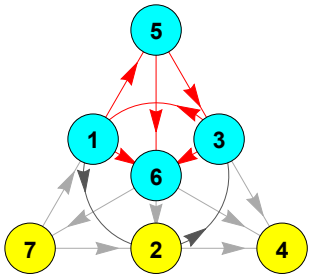
split=2

Fano plane



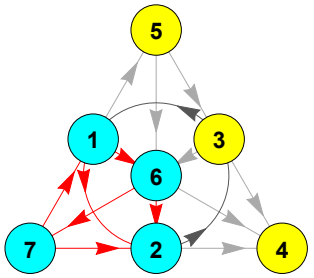
split=4

Fano plane



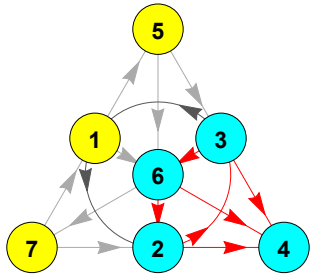
split=6

Fano plane



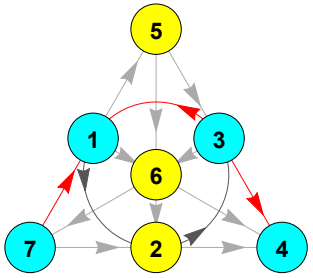
split=3

Fano plane



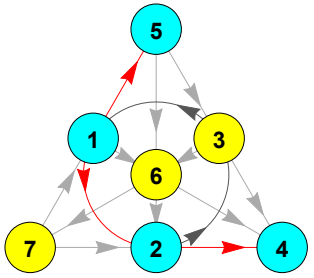
split=5

Fano plane



split=7

Fano plane



Seq # Symbol	2D/3D Shape	Particle	Binary / E8	Ele
		Quantum Bits	Coordinates	#

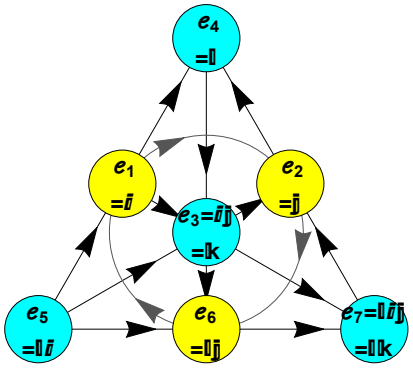
95

0apggsscc
001111000$_2$

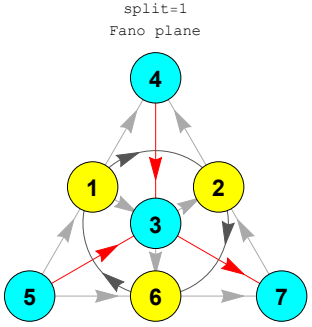
Bn{ 1 1 1 0 1 0 0 0 }
E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }

Lr
103

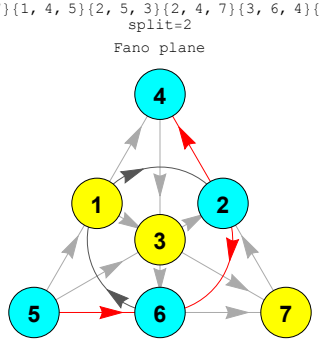
flip=False
{1, 2, 6}{1, 3, 7}{1, 4, 5}{2, 5, 3}{2, 4, 7}{3, 6, 4}{5, 6, 7}

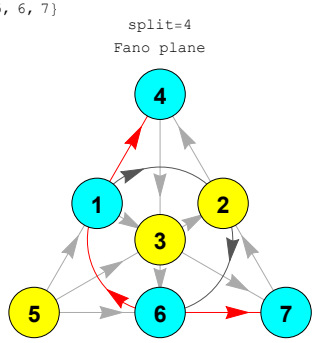


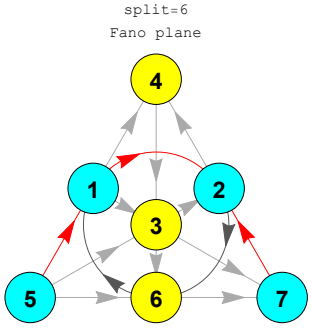
	e1	e2	e3	e4	e5	e6	e7
e1	-1	e6	e7	e5	-e4	-e2	-e3
e2	-e6	-1	-e5	e7	e3	e1	-e4
e3	-e7	e5	-1	-e6	-e2	e4	e1
e4	-e5	-e7	e6	-1	e1	-e3	e2
e5	e4	-e3	e2	-e1	-1	e7	-e6
e6	e2	-e1	-e4	e3	-e7	-1	e5
e7	e3	e4	-e1	-e2	e6	-e5	-1

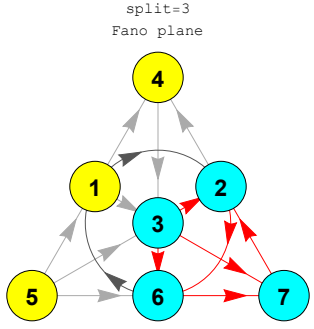


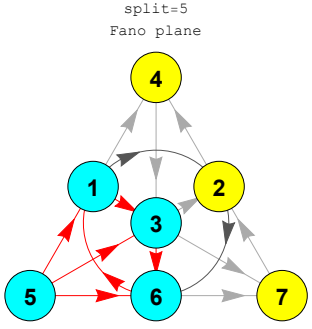
0↦1	1	2	3	4	5	6	7
1	-1	6	7	5	-4	-2	-3
2	-6	-1	-5	7	3	1	-4
3	-7	5	1	6	2	4	-1
4	-5	-7	-6	1	-1	-3	-2
5	4	-3	-2	1	1	7	6
6	2	-1	-4	3	-7	-1	5
7	3	4	1	2	-6	-5	1

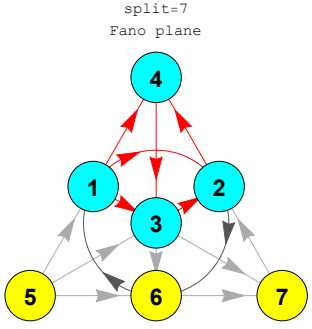




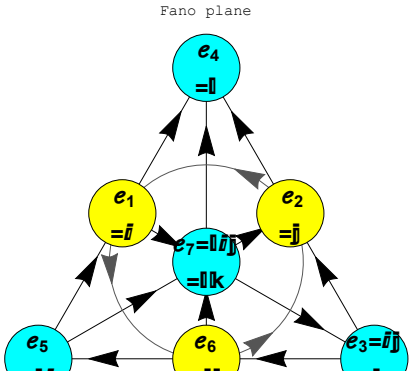




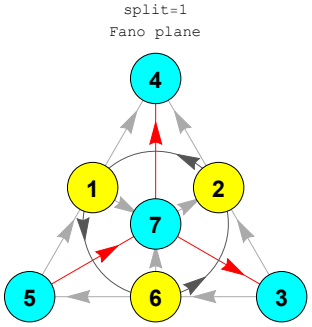




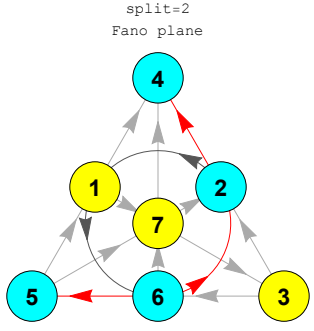
flip=True
{1, 6, 2}{1, 7, 3}{1, 4, 5}{2, 4, 3}{2, 5, 7}{3, 6, 5}{4, 6, 7}

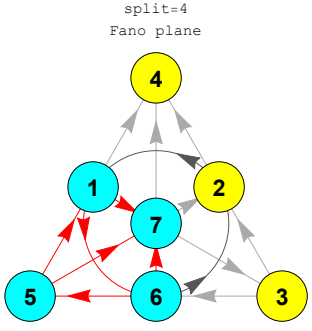


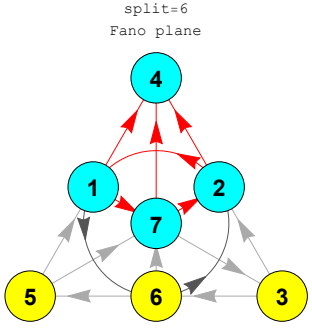
	e1	e2	e3	e4	e5	e6	e7
e1	-1	-e6	-e7	e5	-e4	e2	e3
e2	e6	-1	-e4	e3	e7	-e1	-e5
e3	e7	e4	-1	-e2	-e6	e5	-e1
e4	-e5	-e3	e2	-1	e1	e7	-e6
e5	e4	-e7	e6	-e1	-1	-e3	e2
e6	-e2	e1	-e5	-e7	e3	-1	e4
e7	-e3	e5	e1	e6	-e2	-e4	-1

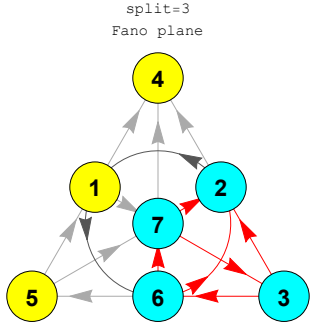


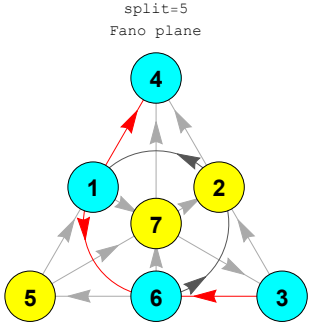
0↦1	1	2	3	4	5	6	7
1	-1	-6	-7	5	-4	2	3
2	6	-1	-4	3	7	-1	-5
3	7	4	1	2	6	5	1
4	-5	-3	-2	1	-1	7	6
5	4	-7	-6	1	1	-3	-2
6	-2	1	-5	-7	3	-1	4
7	-3	5	-1	-6	2	-4	1

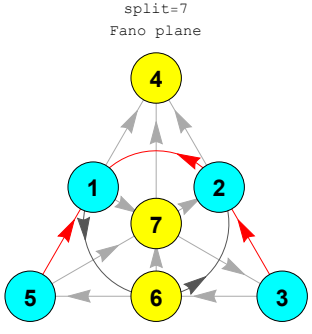












Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Quantum Bits Coordinates #

96 $\frac{}{\underset{rm}{t}}{}^{0\to 1/3}\,t$ 0apggsscc 011111001$_2$

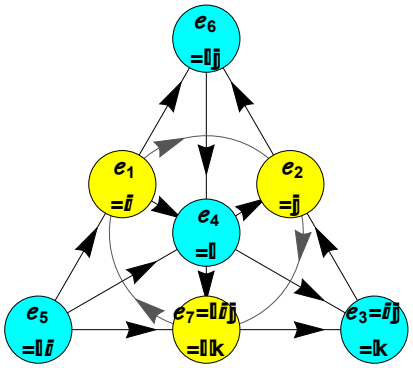
Bn{ 1 1 1 0 0 1 0 0 } Fm

E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ } 100

flip=False

{1, 2, 7}{1, 4, 3}{1, 6, 5}{2, 6, 3}{2, 5, 4}{3, 5, 7}{4, 7, 6}

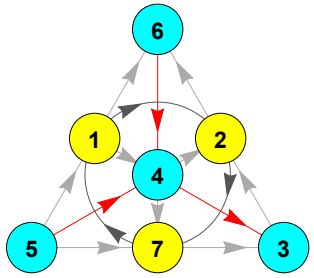
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	$-e_4$	e_3	$-e_6$	e_5	$-e_2$
e_2	e_2	$-e_7$	−1	$-e_6$	$-e_5$	e_4	e_3	e_1
e_3	e_3	e_4	e_6	−1	$-e_1$	e_7	$-e_2$	$-e_5$
e_4	e_4	$-e_3$	e_5	e_1	−1	$-e_2$	$-e_7$	e_6
e_5	e_5	e_6	$-e_4$	$-e_7$	e_2	−1	$-e_1$	e_3
e_6	e_6	$-e_5$	$-e_3$	e_2	e_7	e_1	−1	$-e_4$
e_7	e_7	e_2	$-e_1$	e_5	$-e_6$	$-e_3$	e_4	−1

split=1

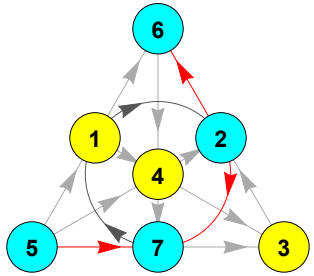
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−4	3	−6	5	−2
2	−7	−1	−6	−5	4	3	1
3	4	6	1	1	−7	2	−5
4	−3	5	−1	1	2	7	6
5	6	−4	7	−2	1	1	3
6	−5	−3	−2	−7	−1	1	−4
7	2	−1	5	−6	−3	4	−1

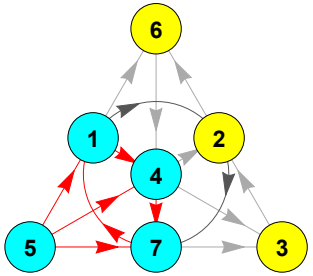
split=2

Fano plane



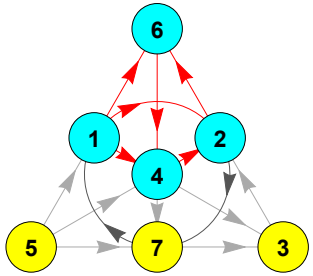
split=4

Fano plane



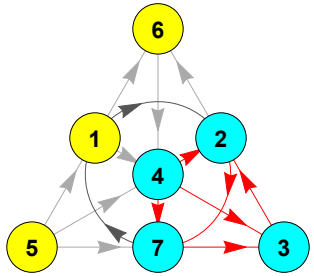
split=6

Fano plane



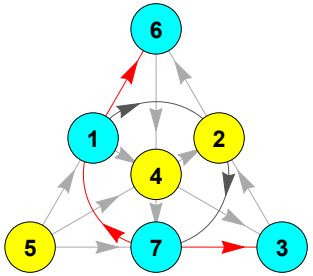
split=3

Fano plane



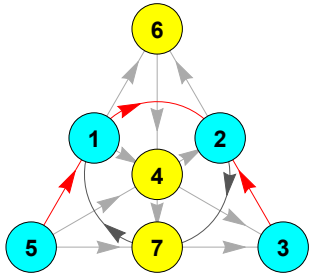
split=5

Fano plane



split=7

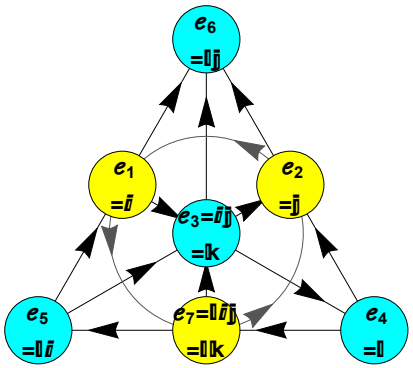
Fano plane



flip=True

{1, 7, 2}{1, 3, 4}{1, 6, 5}{2, 5, 3}{2, 6, 4}{3, 6, 7}{4, 7, 5}

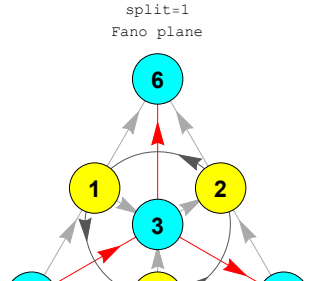
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	e_4	$-e_3$	$-e_6$	e_5	e_2
e_2	e_2	e_7	−1	$-e_5$	$-e_6$	e_3	e_4	$-e_1$
e_3	e_3	$-e_4$	e_5	−1	e_1	$-e_2$	e_7	$-e_6$
e_4	e_4	e_3	e_6	$-e_1$	−1	$-e_7$	$-e_2$	e_5
e_5	e_5	e_6	$-e_3$	e_2	e_7	−1	$-e_1$	$-e_4$
e_6	e_6	$-e_5$	$-e_4$	$-e_7$	e_2	e_1	−1	e_3
e_7	e_7	$-e_2$	e_1	e_6	$-e_5$	e_4	$-e_3$	−1

split=1

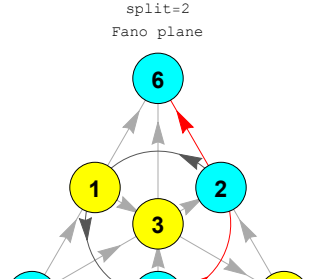
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	4	−3	−6	5	2
2	7	−1	−5	−6	3	4	−1
3	−4	5	1	−1	2	−7	−6
4	3	6	1	1	7	2	5
5	6	−3	−2	−7	1	1	−4
6	−5	−4	7	−2	−1	1	3
7	−2	1	6	−5	4	−3	−1

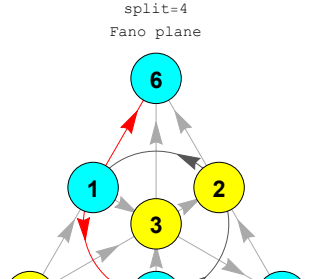
split=2

Fano plane



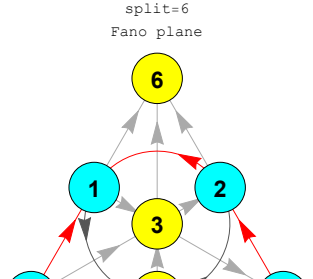
split=4

Fano plane



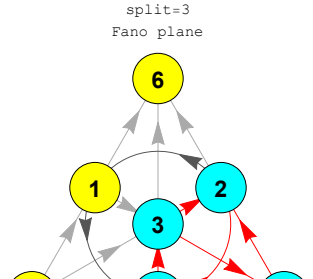
split=6

Fano plane



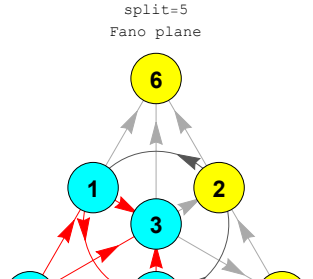
split=3

Fano plane



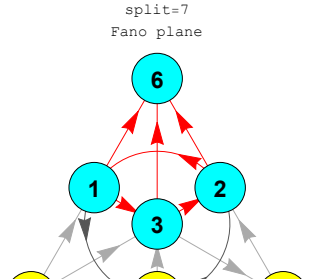
split=5

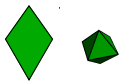
Fano plane



split=7

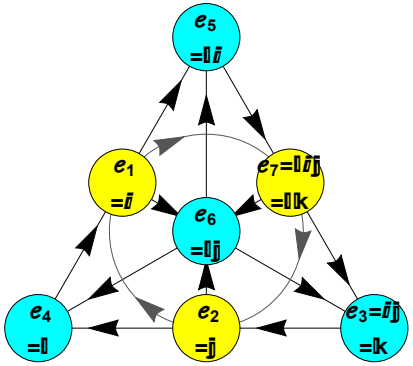
Fano plane



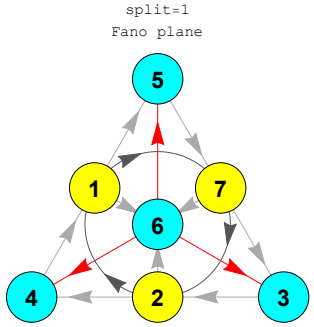
Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates	Ele #
97	$\frac{}{\frac{t}{g_m}}^{0\to 1/3}$		0apggsscc 011111010_2		Bn{ 1 1 1 0 0 0 1 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Cm 96

flip=False

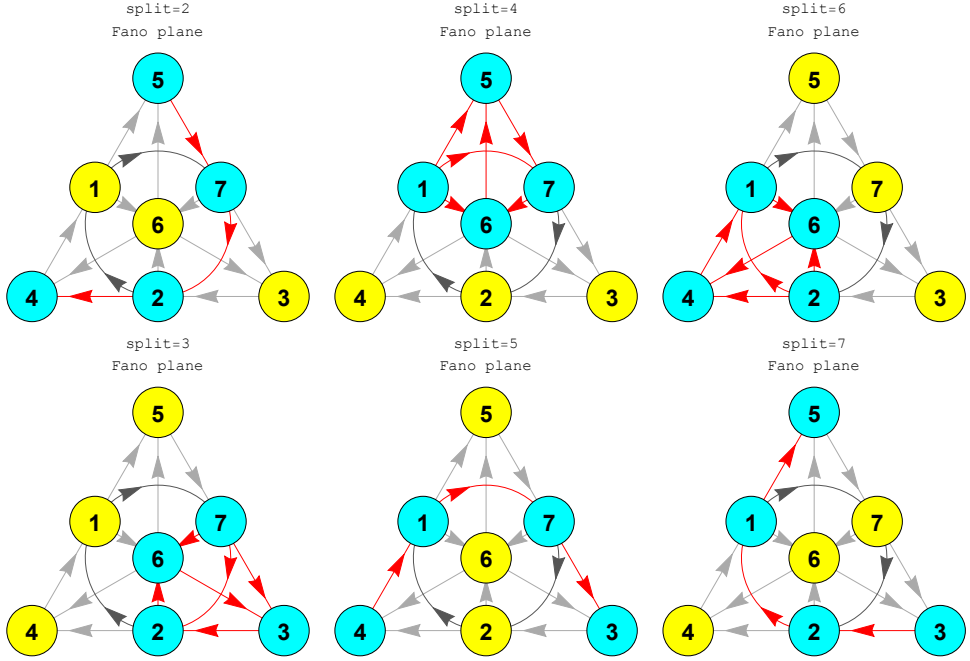
{1, 7, 2}{1, 6, 3}{1, 5, 4}{2, 4, 3}{2, 6, 5}{3, 5, 7}{4, 7, 6}



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_6$	$-e_5$	e_4	e_3	e_2
e_2	e_7	−1	$-e_4$	e_3	$-e_6$	e_5	$-e_1$
e_3	e_6	e_4	−1	$-e_2$	e_7	$-e_1$	$-e_5$
e_4	e_5	$-e_3$	e_2	−1	$-e_1$	$-e_7$	e_6
e_5	$-e_4$	e_6	$-e_7$	e_1	−1	$-e_2$	e_3
e_6	$-e_3$	$-e_5$	e_1	e_7	e_2	−1	$-e_4$
e_7	$-e_2$	e_1	e_5	$-e_6$	$-e_3$	e_4	−1

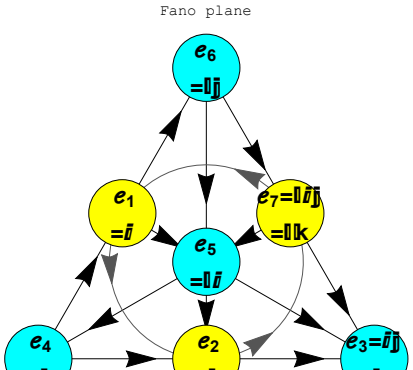


0↦1	1	2	3	4	5	6	7
1	−1	−7	−6	−5	4	3	2
2	7	−1	−4	3	−6	5	−1
3	6	4	1	2	−7	1	−5
4	5	−3	−2	1	1	7	6
5	−4	6	7	−1	1	2	3
6	−3	−5	−1	−7	−2	1	−4
7	−2	1	5	−6	−3	4	−1

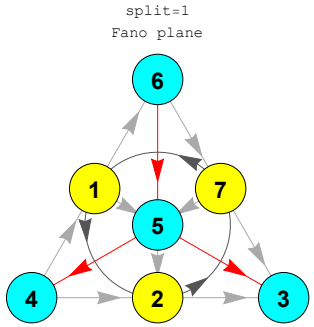


flip=True

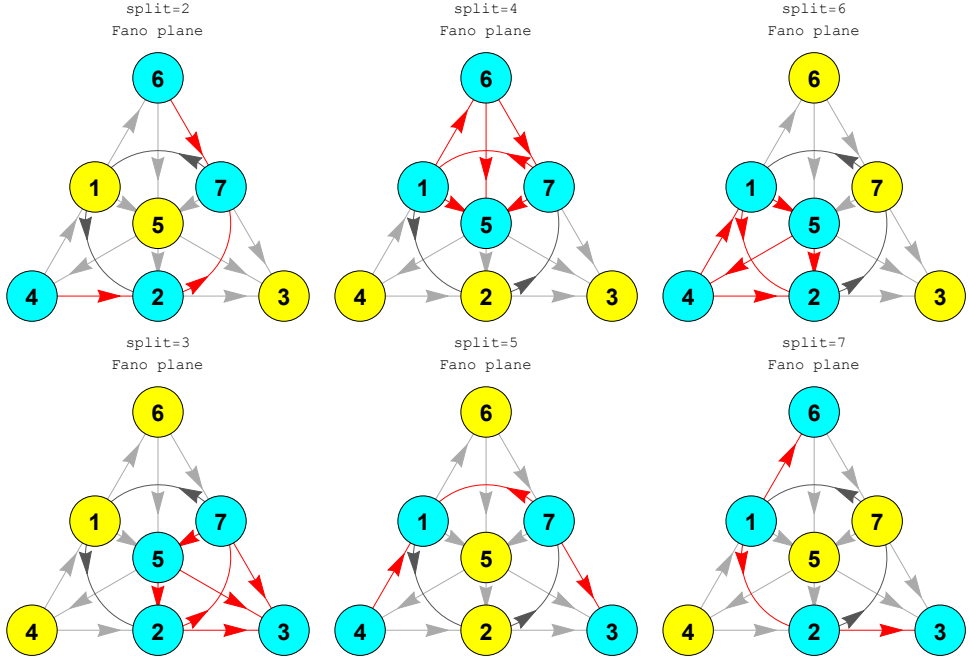
{1, 2, 7}{1, 5, 3}{1, 6, 4}{2, 3, 4}{2, 6, 5}{3, 6, 7}{4, 7, 5}



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_5$	$-e_6$	e_3	e_4	$-e_2$
e_2	$-e_7$	−1	e_4	$-e_3$	$-e_6$	e_5	e_1
e_3	e_5	$-e_4$	−1	e_2	$-e_1$	e_7	$-e_6$
e_4	e_6	e_3	$-e_2$	−1	$-e_7$	$-e_1$	e_5
e_5	$-e_3$	e_6	e_1	e_7	−1	$-e_2$	$-e_4$
e_6	$-e_4$	$-e_5$	$-e_7$	e_1	e_2	−1	e_3
e_7	e_2	$-e_1$	e_6	$-e_5$	e_4	$-e_3$	−1



0↦1	1	2	3	4	5	6	7
1	−1	7	−5	−6	3	4	−2
2	−7	−1	4	−3	−6	5	1
3	5	−4	1	−2	1	−7	−6
4	6	3	2	1	7	1	5
5	−3	6	−1	−7	1	2	−4
6	−4	−5	7	−1	−2	1	3
7	2	−1	6	−5	4	−3	−1



Seq #	Symbol	2D/3D Shape	Particle	Binary / E8	Ele #

Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

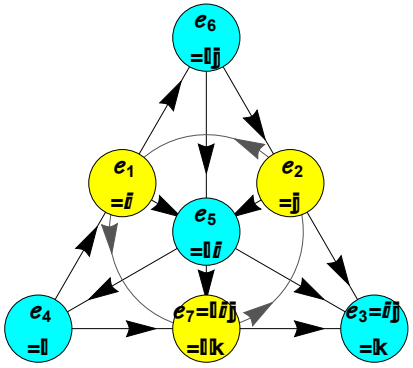
Quantum Bits Coordinates #

98 $\frac{}{\mathrm{t}}{}^{-2/3\to 1/3}_{\mathrm{bm}\ \mathrm{t}}$ 0apggsscc 011111011_2 Bn{ 1 1 1 0 0 0 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ } $\overline{\mathrm{Ru}}$ 44

flip=False

{1, 7, 2}{1, 5, 3}{1, 6, 4}{2, 3, 6}{2, 5, 4}{3, 4, 7}{5, 7, 6}

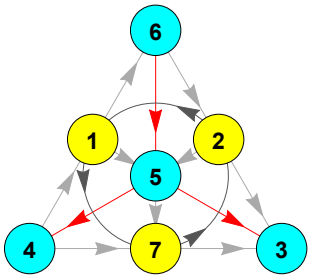
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	$-e_7$	$-e_5$	$-e_6$	e_3	e_4	e_2
e_2	e_2	e_7	-1	e_6	$-e_5$	e_4	$-e_3$	$-e_1$
e_3	e_3	e_5	$-e_6$	-1	e_7	$-e_1$	e_2	$-e_4$
e_4	e_4	e_6	e_5	$-e_7$	-1	$-e_2$	$-e_1$	e_3
e_5	e_5	$-e_3$	$-e_4$	e_1	e_2	-1	$-e_7$	e_6
e_6	e_6	$-e_4$	e_3	$-e_2$	e_1	e_7	-1	$-e_5$
e_7	e_7	$-e_2$	e_1	e_4	$-e_3$	$-e_6$	e_5	-1

split=1

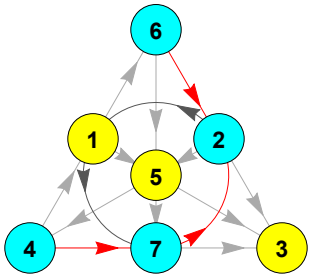
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-7	-5	-6	3	4	2
2	7	-1	6	-5	4	-3	-1
3	5	-6	1	-7	1	-2	-4
4	6	5	7	1	2	1	3
5	-3	-4	-1	-2	1	7	6
6	-4	3	2	-1	-7	1	-5
7	-2	1	4	-3	-6	5	-1

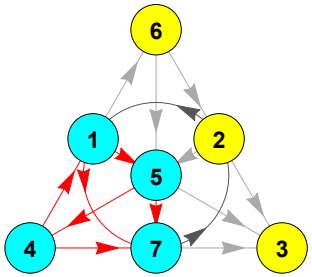
split=2

Fano plane



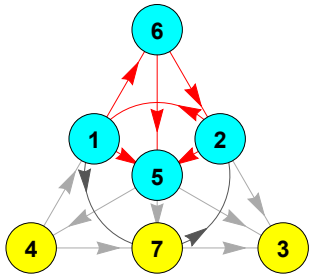
split=4

Fano plane



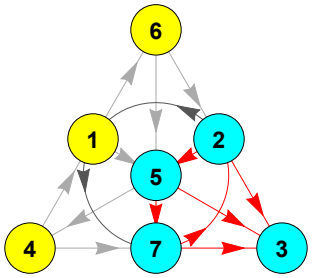
split=6

Fano plane



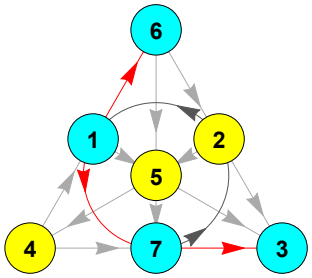
split=3

Fano plane



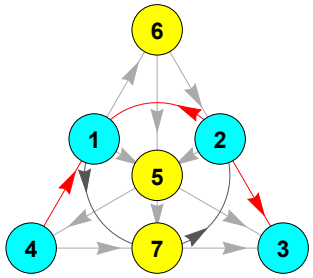
split=5

Fano plane



split=7

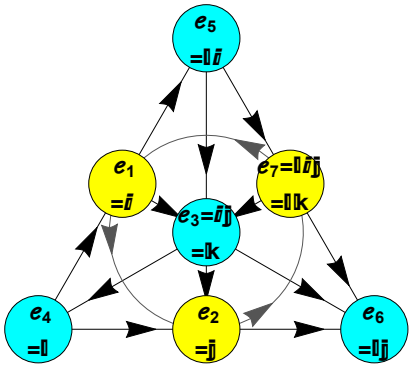
Fano plane



flip=True

{1, 2, 7}{1, 3, 6}{1, 5, 4}{2, 5, 3}{2, 6, 4}{3, 4, 7}{5, 7, 6}

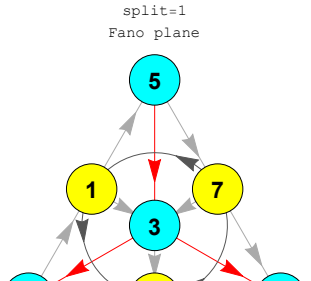
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_7	e_6	$-e_5$	e_4	$-e_3$	$-e_2$
e_2	e_2	$-e_7$	-1	$-e_5$	$-e_6$	e_3	e_4	e_1
e_3	e_3	$-e_6$	e_5	-1	e_7	$-e_2$	e_1	$-e_4$
e_4	e_4	e_5	e_6	$-e_7$	-1	$-e_1$	$-e_2$	e_3
e_5	e_5	$-e_4$	$-e_3$	e_2	e_1	-1	$-e_7$	e_6
e_6	e_6	e_3	$-e_4$	$-e_1$	e_2	e_7	-1	$-e_5$
e_7	e_7	e_2	$-e_1$	e_4	$-e_3$	$-e_6$	e_5	-1

split=1

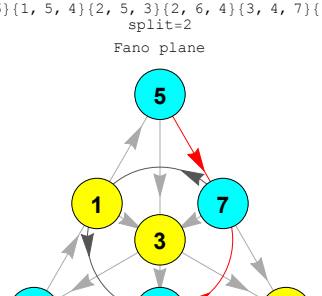
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	7	6	-5	4	-3	-2
2	-7	-1	-5	-6	3	4	1
3	-6	5	1	-7	2	-1	-4
4	5	6	7	1	1	2	3
5	-4	-3	-2	-1	1	7	6
6	3	-4	1	-2	-7	1	-5
7	2	-1	4	-3	-6	5	-1

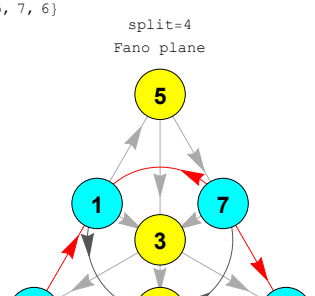
split=2

Fano plane



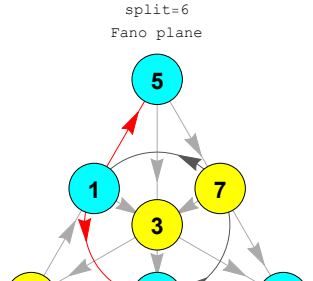
split=4

Fano plane



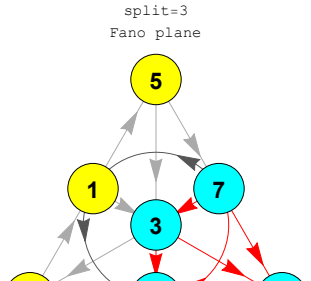
split=6

Fano plane



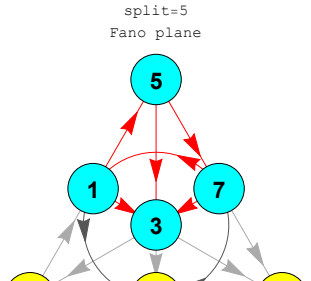
split=3

Fano plane



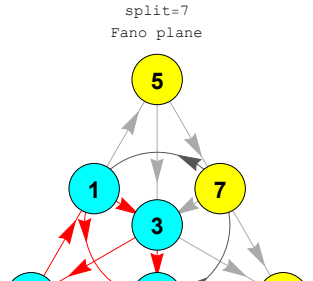
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Quantum Bits Coordinates #

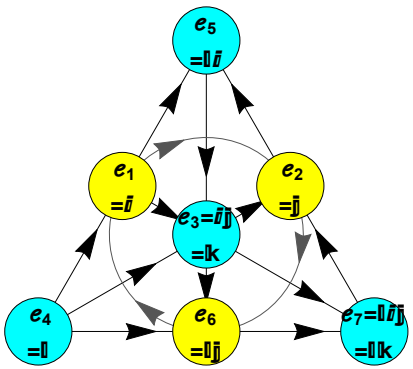
99 0apggsscc Bn{ 1 1 0 1 1 0 0 0 } Es

000111000$_2$ E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ } 99

flip=False

{1, 2, 6}{1, 3, 7}{1, 5, 4}{2, 4, 3}{2, 5, 7}{3, 6, 5}{4, 6, 7}

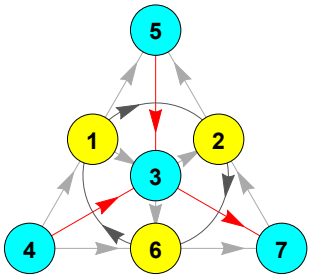
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	e_7	$-e_5$	e_4	$-e_2$	$-e_3$
e_2	$-e_6$	-1	$-e_4$	e_3	e_7	e_1	$-e_5$
e_3	$-e_7$	e_4	-1	$-e_2$	$-e_6$	e_5	e_1
e_4	e_5	$-e_3$	e_2	-1	$-e_1$	e_7	$-e_6$
e_5	$-e_4$	$-e_7$	e_6	e_1	-1	$-e_3$	e_2
e_6	e_2	$-e_1$	$-e_5$	$-e_7$	e_3	-1	e_4
e_7	e_3	e_5	$-e_1$	e_6	$-e_2$	$-e_4$	-1

split=1

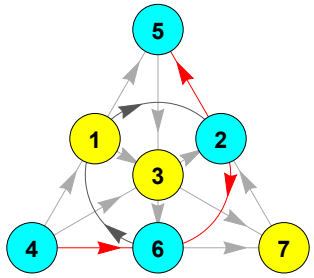
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	7	-5	4	-2	-3
2	-6	-1	-4	3	7	1	-5
3	-7	4	1	2	6	5	-1
4	5	-3	-2	1	1	7	6
5	-4	-7	-6	-1	1	-3	-2
6	2	-1	-5	-7	3	-1	4
7	3	5	1	-6	2	-4	1

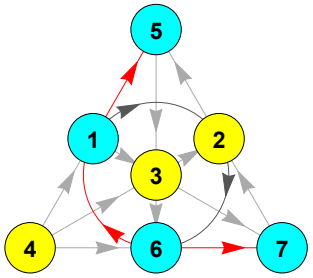
split=2

Fano plane



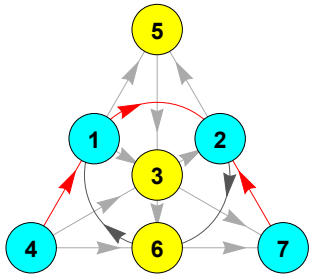
split=4

Fano plane



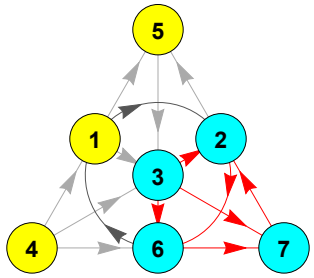
split=6

Fano plane



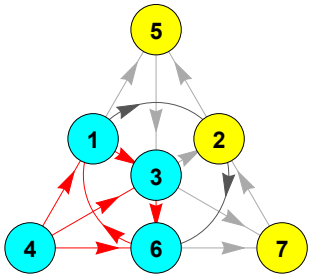
split=3

Fano plane



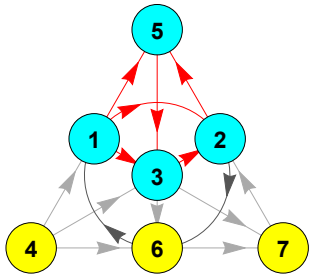
split=5

Fano plane



split=7

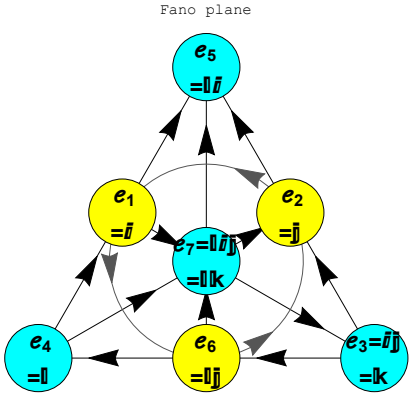
Fano plane



flip=True

{1, 6, 2}{1, 7, 3}{1, 5, 4}{2, 5, 3}{2, 4, 7}{3, 6, 4}{5, 6, 7}

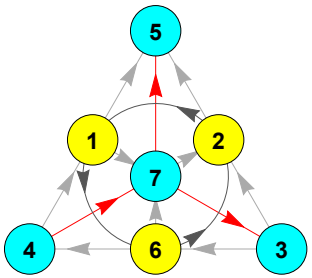
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_6$	$-e_7$	$-e_5$	e_4	e_2	e_3
e_2	e_6	-1	$-e_5$	e_7	e_3	$-e_1$	$-e_4$
e_3	e_7	e_5	-1	$-e_6$	$-e_2$	e_4	$-e_1$
e_4	e_5	$-e_7$	e_6	-1	$-e_1$	$-e_3$	e_2
e_5	$-e_4$	$-e_3$	e_2	e_1	-1	e_7	$-e_6$
e_6	$-e_2$	e_1	$-e_4$	e_3	$-e_7$	-1	e_5
e_7	$-e_3$	e_4	e_1	$-e_2$	e_6	$-e_5$	-1

split=1

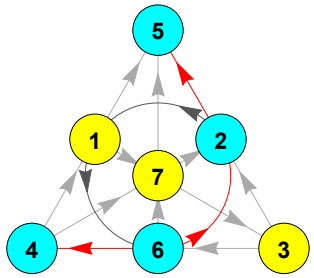
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	-7	-5	4	2	3
2	6	-1	-5	7	3	-1	-4
3	7	5	1	6	2	4	1
4	5	-7	-6	1	1	-3	-2
5	-4	-3	-2	-1	1	7	6
6	-2	1	-4	3	-7	-1	5
7	-3	4	-1	2	-6	-5	1

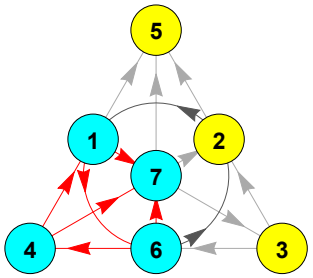
split=2

Fano plane



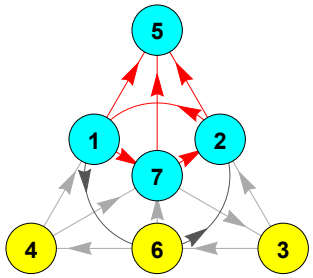
split=4

Fano plane



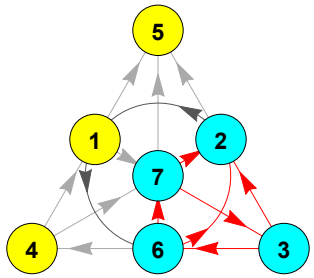
split=6

Fano plane



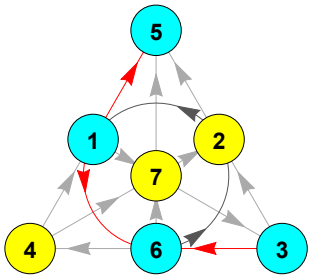
split=3

Fano plane



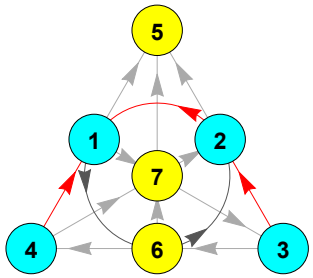
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

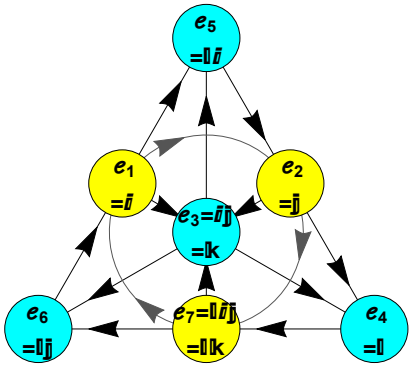
Quantum Bits Coordinates #

100 $\bar{t}_{rm}^{0\to -2/3}$ 0apggsscc 0111111101$_2$ Bn{ 1 1 0 1 0 1 0 0 } Am 95
E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }

flip=False

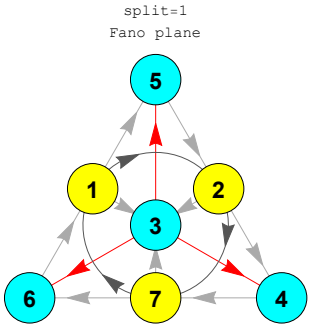
{1, 2, 7}{1, 3, 4}{1, 5, 6}{2, 3, 6}{2, 4, 5}{3, 5, 7}{4, 7, 6}

Fano plane



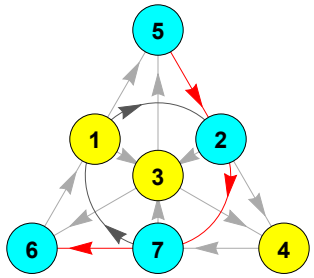
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_7	e_4	$-e_3$	e_6	$-e_5$	$-e_2$
e_2	$-e_7$	-1	e_6	e_5	$-e_4$	$-e_3$	e_1
e_3	$-e_4$	$-e_6$	-1	e_1	e_7	e_2	$-e_5$
e_4	e_3	$-e_5$	$-e_1$	-1	e_2	$-e_7$	e_6
e_5	$-e_6$	e_4	$-e_7$	$-e_2$	-1	e_1	e_3
e_6	e_5	e_3	$-e_2$	e_7	$-e_1$	-1	$-e_4$
e_7	e_2	$-e_1$	e_5	$-e_6$	$-e_3$	e_4	-1

split=1
Fano plane

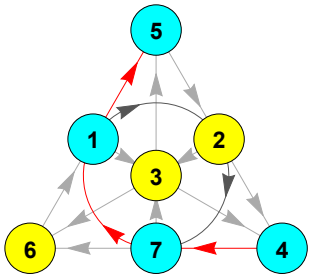


0↦1	1	2	3	4	5	6	7
1	-1	7	4	-3	6	-5	-2
2	-7	-1	6	5	-4	-3	1
3	-4	-6	1	-1	-7	-2	-5
4	3	-5	1	1	-2	7	6
5	-6	4	7	2	1	-1	3
6	5	3	2	-7	1	1	-4
7	2	-1	5	-6	-3	4	-1

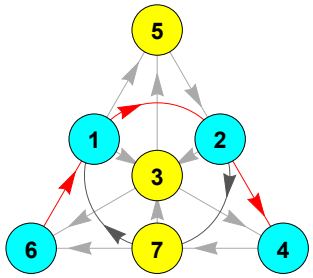
split=2
Fano plane



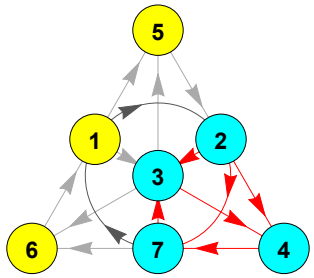
split=4
Fano plane



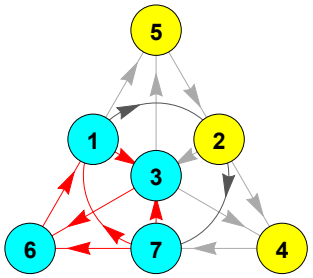
split=6
Fano plane



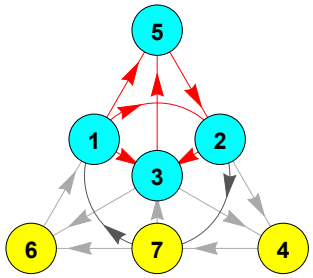
split=3
Fano plane



split=5
Fano plane



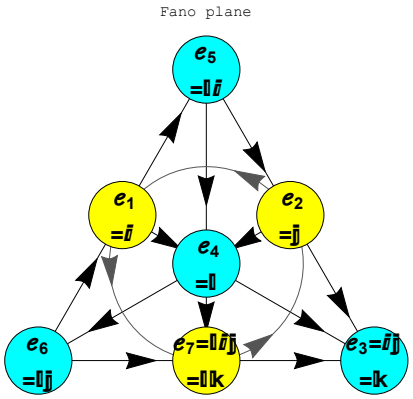
split=7
Fano plane



flip=True

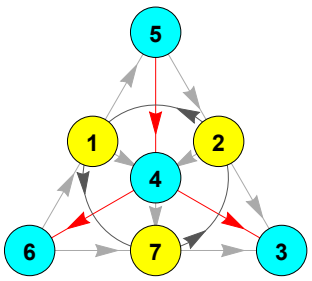
{1, 7, 2}{1, 4, 3}{1, 5, 6}{2, 3, 5}{2, 4, 6}{3, 6, 7}{4, 7, 5}

Fano plane



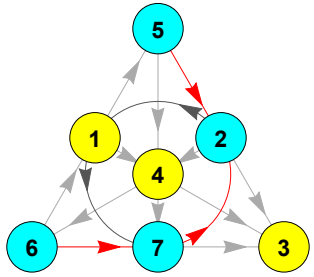
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_7$	$-e_4$	e_3	e_6	$-e_5$	e_2
e_2	e_7	-1	e_5	e_6	$-e_3$	$-e_4$	$-e_1$
e_3	e_4	$-e_5$	-1	$-e_1$	e_2	e_7	$-e_6$
e_4	$-e_3$	$-e_6$	e_1	-1	$-e_7$	e_2	e_5
e_5	$-e_6$	e_3	$-e_2$	e_7	-1	e_1	$-e_4$
e_6	e_5	e_4	$-e_7$	$-e_2$	$-e_1$	-1	e_3
e_7	$-e_2$	e_1	e_6	$-e_5$	e_4	$-e_3$	-1

split=1
Fano plane

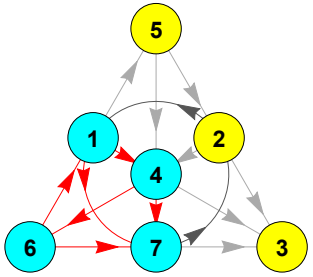


0↦1	1	2	3	4	5	6	7
1	-1	-7	-4	3	6	-5	2
2	7	-1	5	6	-3	-4	-1
3	4	-5	1	1	-2	-7	-6
4	-3	-6	-1	1	7	-2	5
5	-6	3	2	-7	1	-1	-4
6	5	4	7	2	1	1	3
7	-2	1	6	-5	4	-3	-1

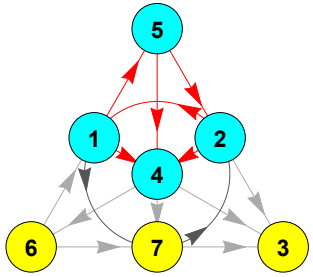
split=2
Fano plane



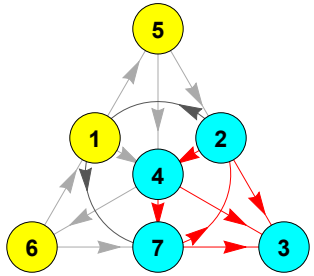
split=4
Fano plane



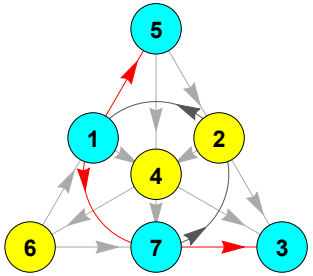
split=6
Fano plane



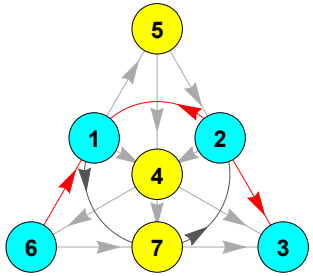
split=3
Fano plane



split=5
Fano plane

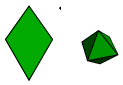


split=7
Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

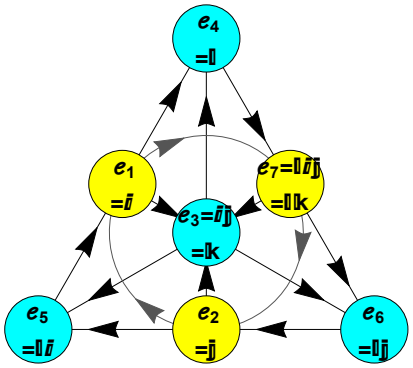
Quantum Bits Coordinates #

101 $\overline{t}_{gm}^{0\mapsto -2/3}$  0apggsscc 0111111110_2 Bn{ 1 1 0 1 0 0 1 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ } U 92

flip=False

{1, 7, 2}{1, 3, 6}{1, 4, 5}{2, 3, 4}{2, 5, 6}{3, 5, 7}{4, 7, 6}

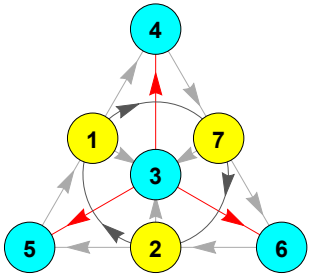
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	e_6	e_5	$-e_4$	$-e_3$	e_2
e_2	e_2	e_7	−1	e_4	$-e_3$	e_6	$-e_5$	$-e_1$
e_3	e_3	$-e_6$	$-e_4$	−1	e_2	e_7	e_1	$-e_5$
e_4	e_4	$-e_5$	e_3	$-e_2$	−1	e_1	$-e_7$	e_6
e_5	e_5	e_4	$-e_6$	$-e_7$	$-e_1$	−1	e_2	e_3
e_6	e_6	e_3	e_5	$-e_1$	e_7	$-e_2$	−1	$-e_4$
e_7	e_7	$-e_2$	e_1	e_5	$-e_6$	$-e_3$	e_4	−1

split=1

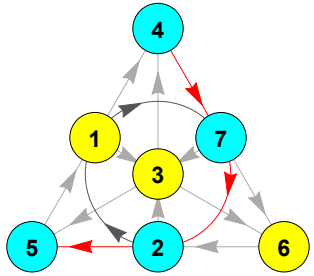
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	6	5	−4	−3	2
2	7	−1	4	−3	6	−5	−1
3	−6	−4	1	−2	−7	−1	−5
4	−5	3	2	1	−1	7	6
5	4	−6	7	1	1	−2	3
6	3	5	1	−7	2	1	−4
7	−2	1	5	−6	−3	4	−1

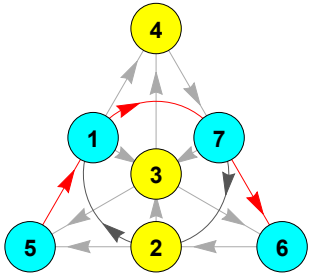
split=2

Fano plane



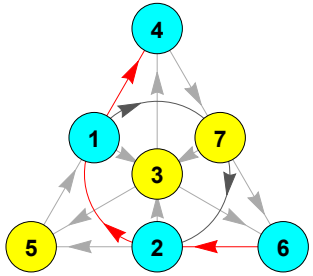
split=4

Fano plane



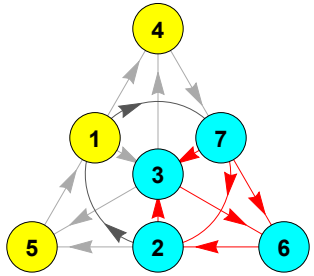
split=6

Fano plane



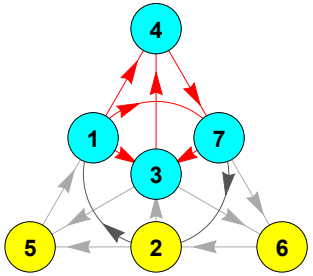
split=3

Fano plane



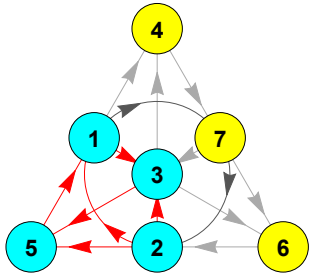
split=5

Fano plane



split=7

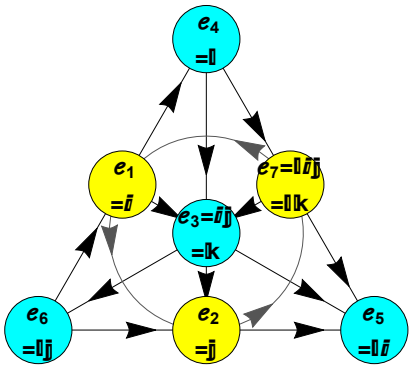
Fano plane



flip=True

{1, 2, 7}{1, 3, 5}{1, 4, 6}{2, 4, 3}{2, 5, 6}{3, 6, 7}{4, 7, 5}

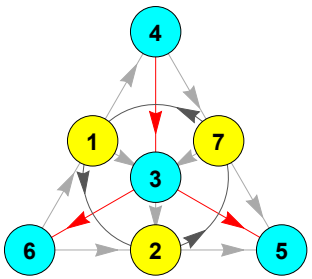
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	e_5	e_6	$-e_3$	$-e_4$	$-e_2$
e_2	e_2	$-e_7$	−1	$-e_4$	e_3	e_6	$-e_5$	e_1
e_3	e_3	$-e_5$	e_4	−1	$-e_2$	e_1	e_7	$-e_6$
e_4	e_4	$-e_6$	$-e_3$	e_2	−1	$-e_7$	e_1	e_5
e_5	e_5	e_3	$-e_6$	$-e_1$	e_7	−1	e_2	$-e_4$
e_6	e_6	e_4	e_5	$-e_7$	$-e_1$	$-e_2$	−1	e_3
e_7	e_7	e_2	$-e_1$	e_6	$-e_5$	e_4	$-e_3$	−1

split=1

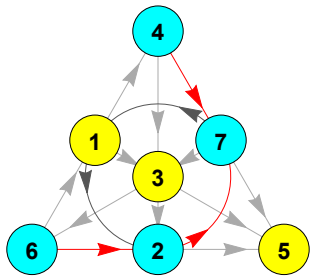
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	5	6	−3	−4	−2
2	−7	−1	−4	3	6	−5	1
3	−5	4	1	2	−1	−7	−6
4	−6	−3	−2	1	7	−1	5
5	3	−6	1	−7	1	−2	−4
6	4	5	7	1	2	1	3
7	2	−1	6	−5	4	−3	−1

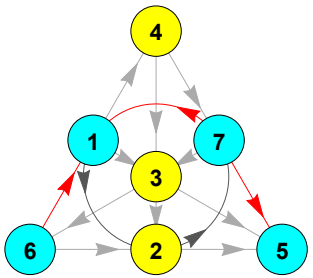
split=2

Fano plane



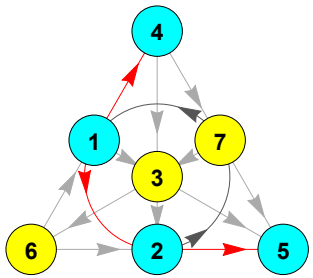
split=4

Fano plane



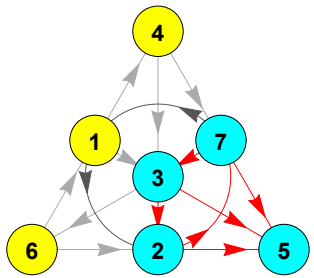
split=6

Fano plane



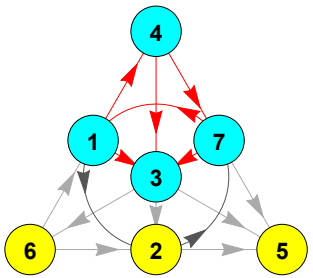
split=3

Fano plane



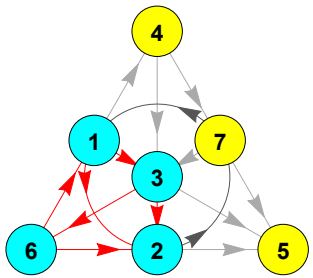
split=5

Fano plane



split=7

Fano plane

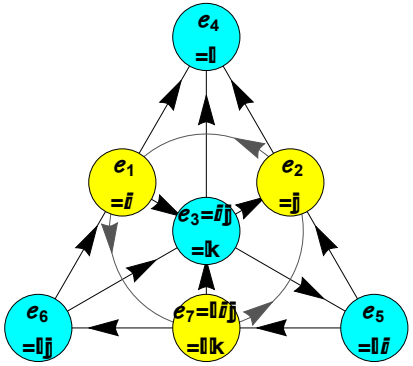


Seq # Symbol	2D/3D Shape	Particle	Binary / E8	Ele
	Quantum Bits		Coordinates	#
102	$\overline{t}_{b_m}^{-2/3}$	0apggsscc 011111111_2	Bn{ 1 1 0 1 0 0 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Sb}$ 51

flip=False

{1, 7, 2}{1, 3, 5}{1, 4, 6}{2, 6, 3}{2, 4, 5}{3, 4, 7}{5, 7, 6}

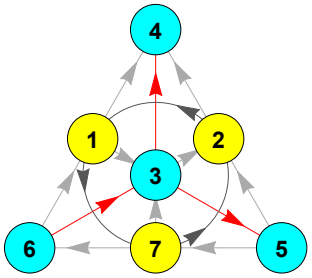
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	e_5	e_6	$-e_3$	$-e_4$	e_2
e_2	e_7	−1	$-e_6$	e_5	$-e_4$	e_3	$-e_1$	
e_3	$-e_5$	e_6	−1	e_7	e_1	$-e_2$	$-e_4$	
e_4	$-e_6$	$-e_5$	$-e_7$	−1	e_2	e_1	e_3	
e_5	e_3	e_4	$-e_1$	$-e_2$	−1	$-e_7$	e_6	
e_6	e_4	$-e_3$	e_2	$-e_1$	e_7	−1	$-e_5$	
e_7	$-e_2$	e_1	e_4	$-e_3$	$-e_6$	e_5	−1	

split=1

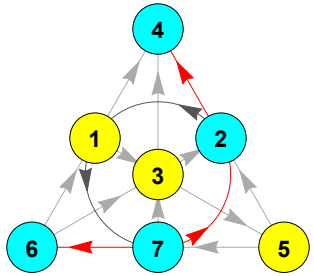
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	5	6	−3	−4	2
2	7	−1	−6	5	−4	3	−1
3	−5	6	1	−7	−1	2	−4
4	−6	−5	7	1	−2	−1	3
5	3	4	1	2	1	7	6
6	4	−3	−2	1	−7	1	−5
7	−2	1	4	−3	−6	5	−1

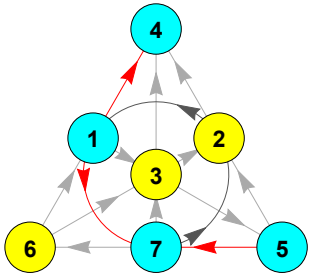
split=2

Fano plane



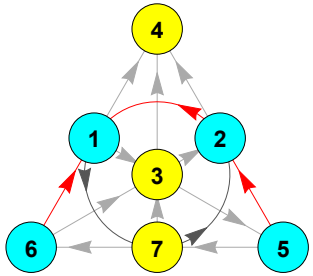
split=4

Fano plane



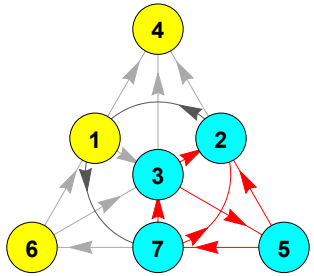
split=6

Fano plane



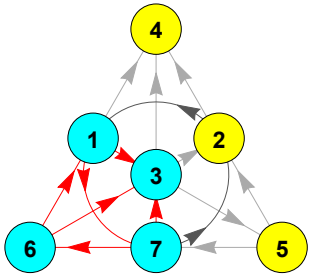
split=3

Fano plane



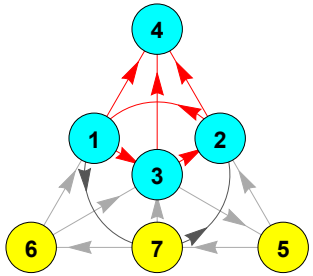
split=5

Fano plane



split=7

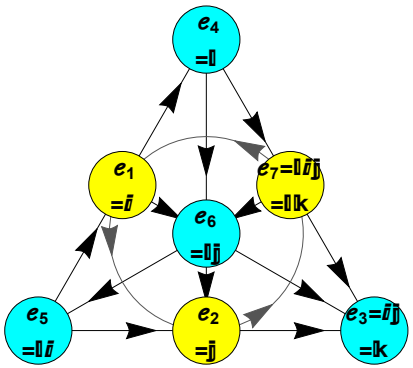
Fano plane



flip=True

{1, 2, 7}{1, 6, 3}{1, 4, 5}{2, 3, 5}{2, 4, 6}{3, 4, 7}{5, 7, 6}

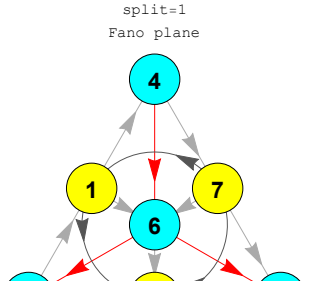
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	$-e_6$	e_5	$-e_4$	e_3	$-e_2$
e_2	$-e_7$	−1	e_5	e_6	$-e_3$	$-e_4$	e_1	
e_3	e_6	$-e_5$	−1	e_7	e_2	$-e_1$	$-e_4$	
e_4	$-e_5$	$-e_6$	$-e_7$	−1	e_1	e_2	e_3	
e_5	e_4	e_3	$-e_2$	$-e_1$	−1	$-e_7$	e_6	
e_6	$-e_3$	e_4	e_1	$-e_2$	e_7	−1	$-e_5$	
e_7	e_2	$-e_1$	e_4	$-e_3$	$-e_6$	e_5	−1	

split=1

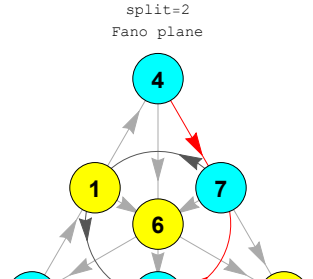
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−6	5	−4	3	−2
2	−7	−1	5	6	−3	−4	1
3	6	−5	1	−7	−2	1	−4
4	−5	−6	7	1	−1	−2	3
5	4	3	2	1	1	7	6
6	−3	4	−1	2	−7	1	−5
7	2	−1	4	−3	−6	5	−1

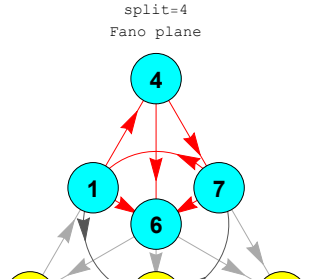
split=2

Fano plane



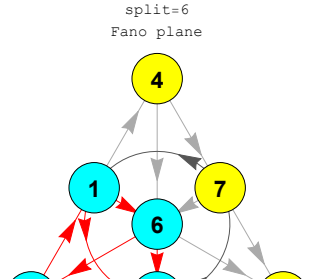
split=4

Fano plane



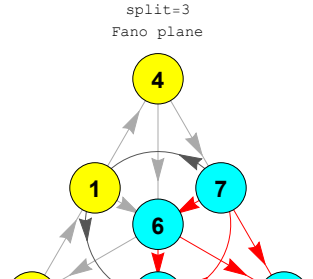
split=6

Fano plane



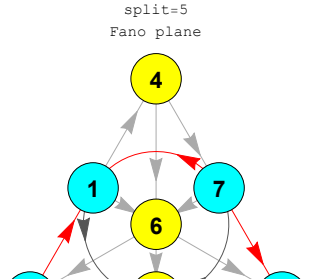
split=3

Fano plane



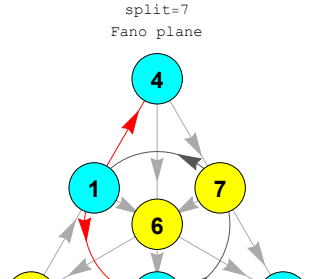
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Quantum Bits Coordinates #

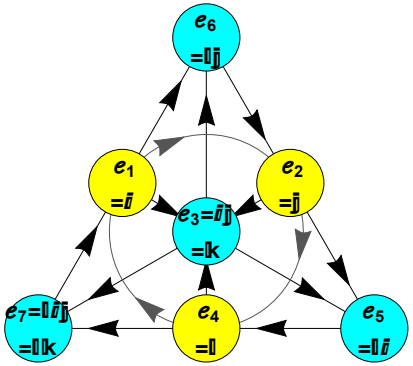
103 $\overline{\underset{o_1}{d}}^{\,\mapsto 1/3}$ 0apggsscc Bn{ 1 1 0 0 1 1 0 0 } Pa

010010101_2 E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ } 91

flip=False

{1, 2, 4}{1, 3, 5}{1, 6, 7}{2, 3, 7}{2, 5, 6}{3, 6, 4}{4, 7, 5}

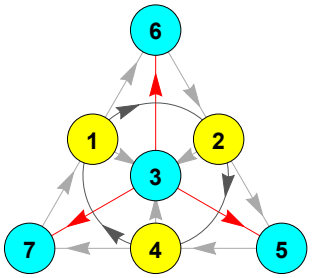
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	e_5	$-e_2$	$-e_3$	e_7	$-e_6$
e_2	e_2	$-e_4$	−1	e_7	e_1	e_6	$-e_5$	$-e_3$
e_3	e_3	$-e_5$	$-e_7$	−1	$-e_6$	e_1	e_4	e_2
e_4	e_4	e_2	$-e_1$	e_6	−1	$-e_7$	$-e_3$	e_5
e_5	e_5	e_3	$-e_6$	$-e_1$	e_7	−1	e_2	$-e_4$
e_6	e_6	$-e_7$	e_5	$-e_4$	e_3	$-e_2$	−1	e_1
e_7	e_7	e_6	e_3	$-e_2$	$-e_5$	e_4	$-e_1$	−1

split=1

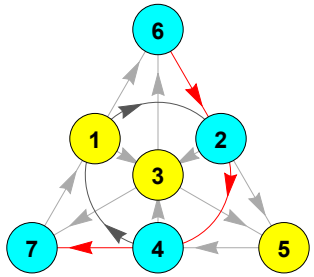
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	5	−2	−3	7	−6
2	−4	−1	7	1	6	−5	−3
3	−5	−7	1	−6	−1	−4	−2
4	2	−1	6	−1	−7	−3	5
5	3	−6	1	7	1	−2	4
6	−7	5	4	3	2	1	−1
7	6	3	2	−5	−4	1	1

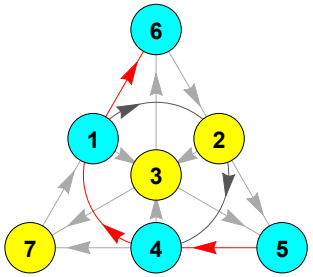
split=2

Fano plane



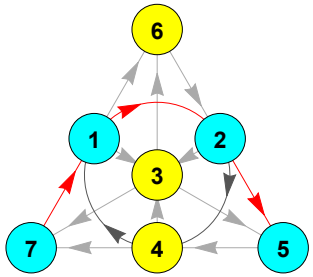
split=4

Fano plane



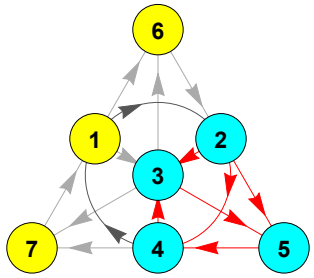
split=6

Fano plane



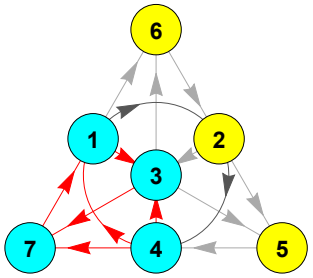
split=3

Fano plane



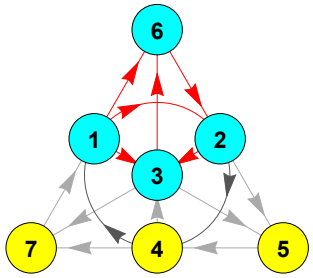
split=5

Fano plane



split=7

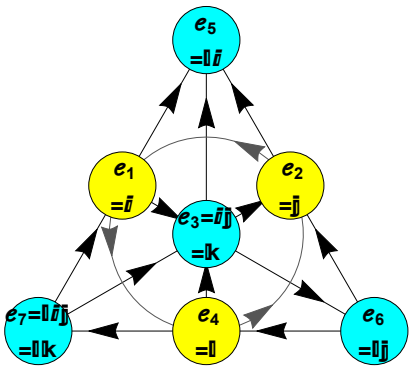
Fano plane



flip=True

{1, 4, 2}{1, 3, 6}{1, 5, 7}{2, 7, 3}{2, 5, 6}{3, 5, 4}{4, 7, 6}

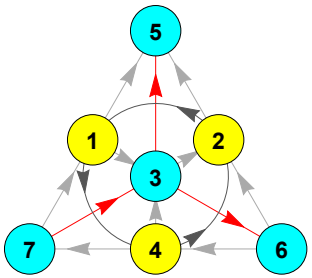
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_4$	e_6	e_2	e_7	$-e_3$	$-e_5$
e_2	e_4	−1	$-e_7$	$-e_1$	e_6	$-e_5$	e_3	
e_3	$-e_6$	e_7	−1	$-e_5$	e_4	e_1	$-e_2$	
e_4	$-e_2$	e_1	e_5	−1	$-e_3$	$-e_7$	e_6	
e_5	$-e_7$	$-e_6$	$-e_4$	e_3	−1	e_2	e_1	
e_6	e_3	e_5	$-e_1$	e_7	$-e_2$	−1	$-e_4$	
e_7	e_5	$-e_3$	e_2	$-e_6$	$-e_1$	e_4	−1	

split=1

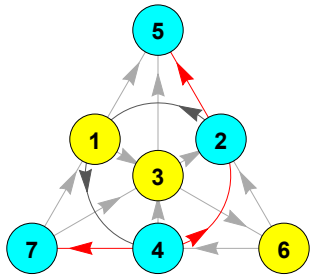
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	6	2	7	−3	−5
2	4	−1	−7	−1	6	−5	3
3	−6	7	1	−5	−4	−1	2
4	−2	1	5	−1	−3	−7	6
5	−7	−6	4	3	1	−2	−1
6	3	5	1	7	2	1	4
7	5	−3	−2	−6	1	−4	1

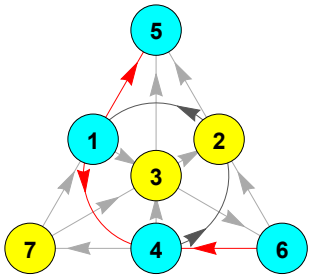
split=2

Fano plane



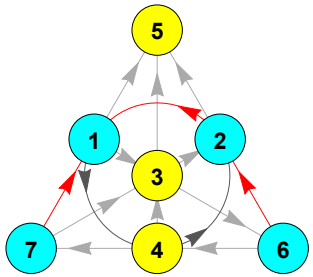
split=4

Fano plane



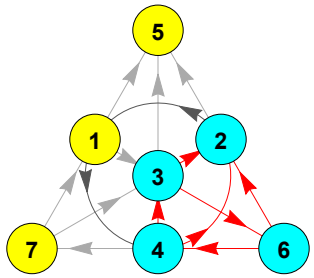
split=6

Fano plane



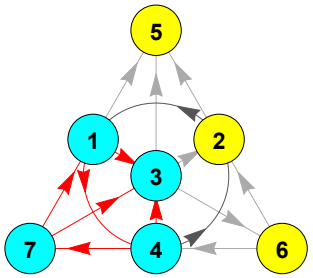
split=3

Fano plane



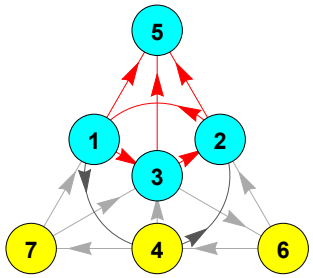
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Quantum Bits Coordinates #

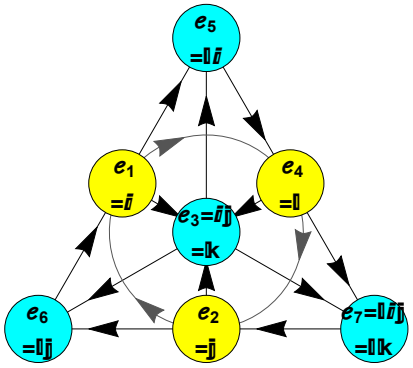
104 $\overline{\underset{c_1}{d}}^{\,t\mapsto 1/3}$ 0apggsscc Bn{ 1 1 0 0 1 0 1 0 } Ra

010010110$_2$ E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ } 88

flip=False

{1, 4, 2}{1, 3, 7}{1, 5, 6}{2, 3, 5}{2, 6, 7}{3, 6, 4}{4, 7, 5}

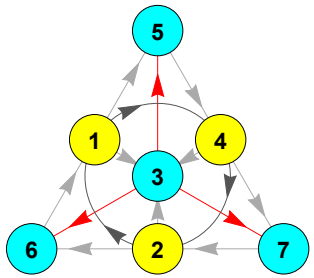
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_7	e_2	e_6	$-e_5$	$-e_3$
e_2	e_4	−1	e_5	$-e_1$	$-e_3$	e_7	$-e_6$
e_3	$-e_7$	$-e_5$	−1	$-e_6$	e_2	e_4	e_1
e_4	$-e_2$	e_1	e_6	−1	$-e_7$	$-e_3$	e_5
e_5	$-e_6$	e_3	$-e_2$	e_7	−1	e_1	$-e_4$
e_6	e_5	$-e_7$	$-e_4$	e_3	$-e_1$	−1	e_2
e_7	e_3	e_6	$-e_1$	$-e_5$	e_4	$-e_2$	−1

split=1

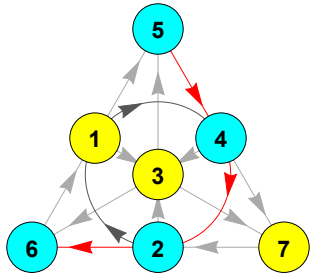
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	7	2	6	−5	−3
2	4	−1	5	−1	−3	7	−6
3	−7	−5	1	−6	−2	−4	−1
4	−2	1	6	−1	−7	−3	5
5	−6	3	2	7	1	−1	4
6	5	−7	4	3	1	1	−2
7	3	6	1	−5	−4	2	1

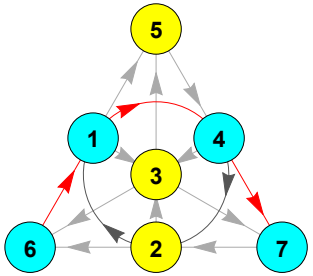
split=2

Fano plane



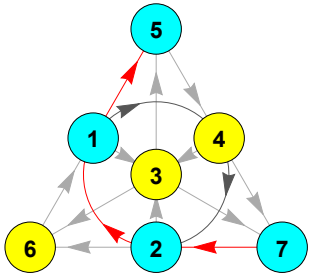
split=4

Fano plane



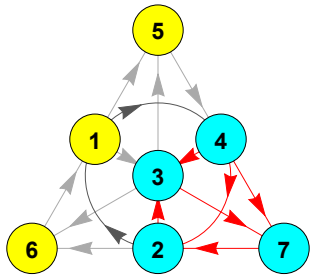
split=6

Fano plane



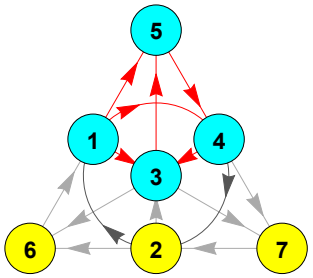
split=3

Fano plane



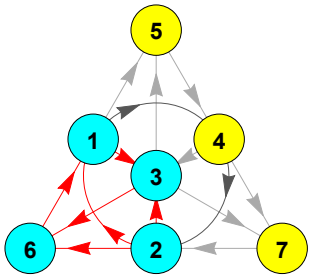
split=5

Fano plane



split=7

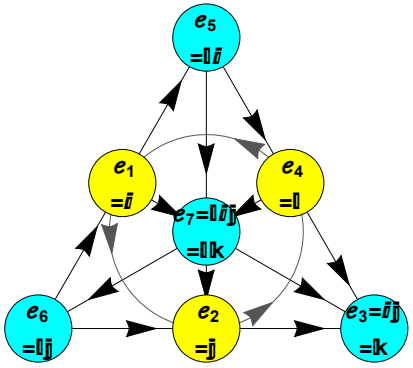
Fano plane



flip=True

{1, 2, 4}{1, 7, 3}{1, 5, 6}{2, 3, 6}{2, 5, 7}{3, 5, 4}{4, 7, 6}

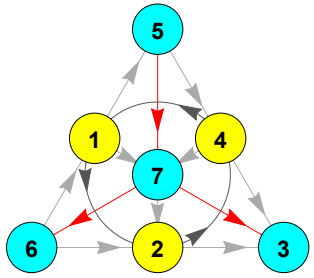
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_7$	$-e_2$	e_6	$-e_5$	e_3
e_2	$-e_4$	−1	e_6	e_1	e_7	$-e_3$	$-e_5$
e_3	e_7	$-e_6$	−1	$-e_5$	e_4	e_2	$-e_1$
e_4	e_2	$-e_1$	e_5	−1	$-e_3$	$-e_7$	e_6
e_5	$-e_6$	$-e_7$	$-e_4$	e_3	−1	e_1	e_2
e_6	e_5	e_3	$-e_2$	e_7	$-e_1$	−1	$-e_4$
e_7	$-e_3$	e_5	e_1	$-e_6$	$-e_2$	e_4	−1

split=1

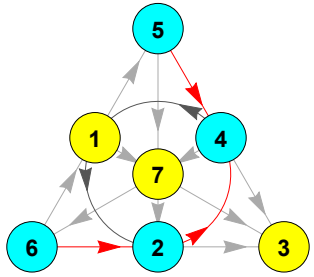
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−7	−2	6	−5	3
2	−4	−1	6	1	7	−3	−5
3	7	−6	1	−5	−4	−2	1
4	2	−1	5	−1	−3	−7	6
5	−6	−7	4	3	1	−1	−2
6	5	3	2	7	1	1	4
7	−3	5	−1	−6	2	−4	1

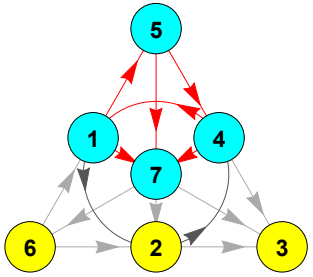
split=2

Fano plane



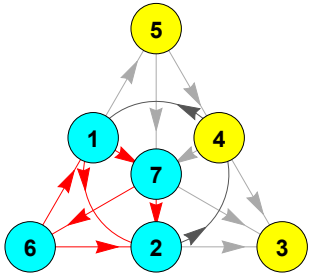
split=4

Fano plane



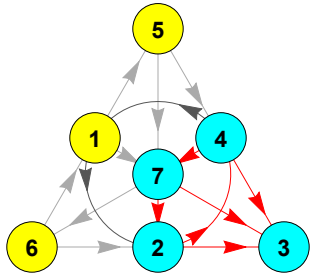
split=6

Fano plane



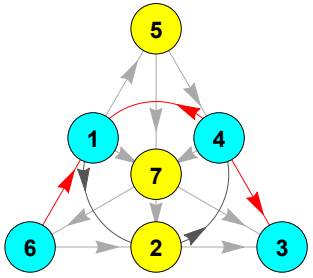
split=3

Fano plane



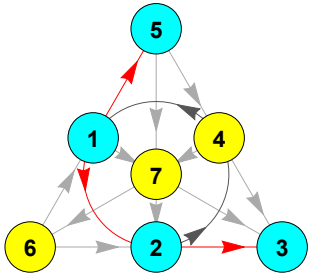
split=5

Fano plane



split=7

Fano plane

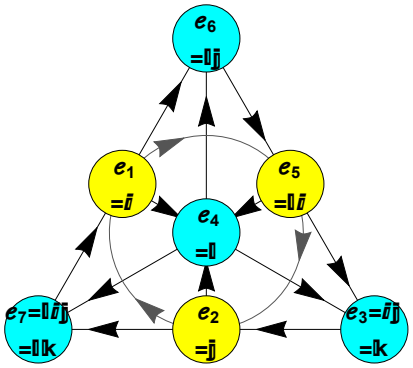


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
105	$\overline{\frac{d}{m_1}}^{1/3}$		0apggsscc 010010111_2	Bn{ 1 1 0 0 1 0 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{La}$ 57

flip=False

{1, 5, 2}{1, 4, 3}{1, 6, 7}{2, 7, 3}{2, 4, 6}{3, 6, 5}{4, 7, 5}

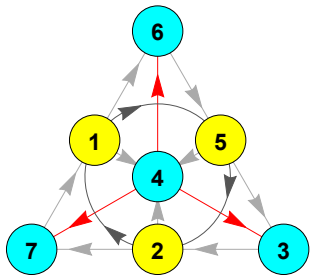
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_4$	e_3	e_2	e_7	$-e_6$
e_2	e_5	−1	$-e_7$	e_6	$-e_1$	$-e_4$	e_3
e_3	e_4	e_7	−1	$-e_1$	$-e_6$	e_5	$-e_2$
e_4	$-e_3$	$-e_6$	e_1	−1	$-e_7$	e_2	e_5
e_5	$-e_2$	e_1	e_6	e_7	−1	$-e_3$	$-e_4$
e_6	$-e_7$	e_4	$-e_5$	$-e_2$	e_3	−1	e_1
e_7	e_6	$-e_3$	e_2	$-e_5$	e_4	$-e_1$	−1

split=1

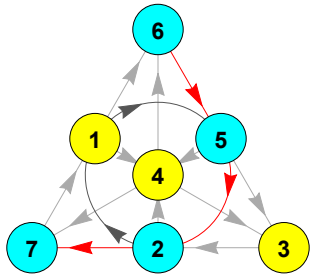
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−4	3	2	7	−6
2	5	−1	−7	6	−1	−4	3
3	4	7	1	1	−6	−5	2
4	−3	−6	−1	1	−7	−2	−5
5	−2	1	6	7	−1	−3	−4
6	−7	4	5	2	3	1	−1
7	6	−3	−2	5	4	1	1

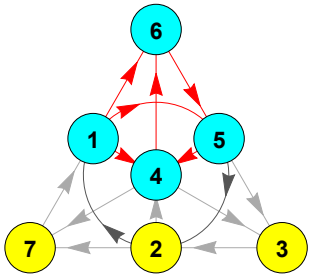
split=2

Fano plane



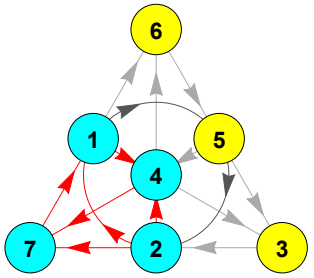
split=4

Fano plane



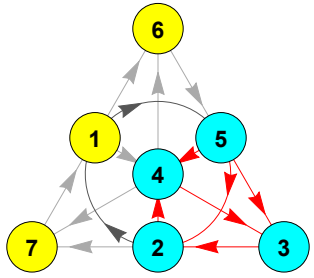
split=6

Fano plane



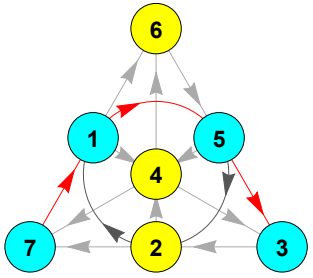
split=3

Fano plane



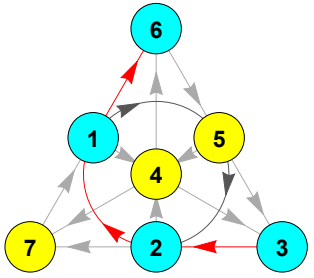
split=5

Fano plane



split=7

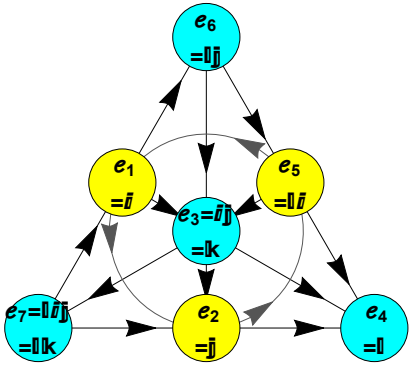
Fano plane



flip=True

{1, 2, 5}{1, 3, 4}{1, 6, 7}{2, 6, 3}{2, 4, 7}{3, 7, 5}{4, 6, 5}

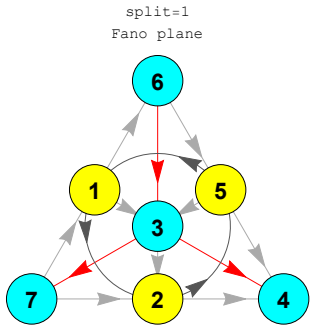
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_4	$-e_3$	$-e_2$	e_7	$-e_6$
e_2	$-e_5$	−1	$-e_6$	e_7	e_1	e_3	$-e_4$
e_3	$-e_4$	e_6	−1	e_1	$-e_7$	$-e_2$	e_5
e_4	e_3	$-e_7$	$-e_1$	−1	$-e_6$	e_5	e_2
e_5	e_2	$-e_1$	e_7	e_6	−1	$-e_4$	$-e_3$
e_6	$-e_7$	$-e_3$	e_2	$-e_5$	e_4	−1	e_1
e_7	e_6	e_4	$-e_5$	$-e_2$	e_3	$-e_1$	−1

split=1

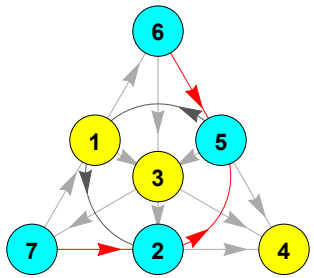
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	4	−3	−2	7	−6
2	−5	−1	−6	7	1	3	−4
3	−4	6	1	−1	−7	2	−5
4	3	−7	1	1	−6	−5	−2
5	2	−1	7	6	−1	−4	−3
6	−7	−3	−2	5	4	1	−1
7	6	4	5	2	3	1	1

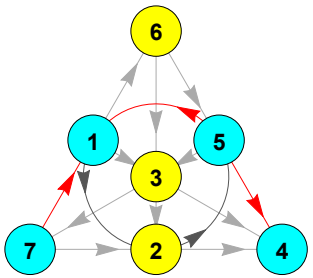
split=2

Fano plane



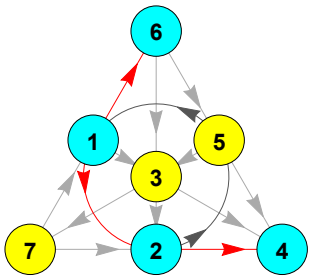
split=4

Fano plane



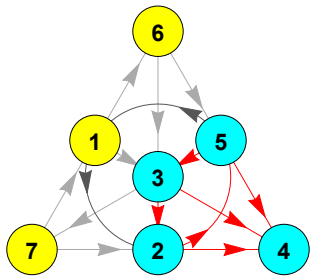
split=6

Fano plane



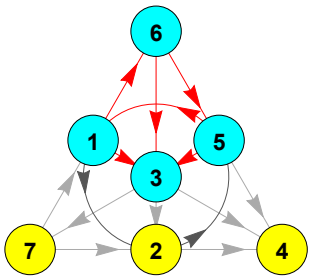
split=3

Fano plane



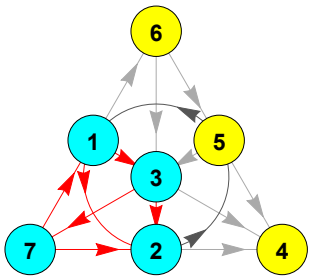
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Quantum Bits Coordinates #

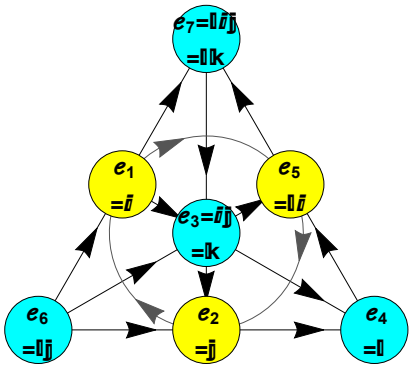
106 $u_{b_d}^{2/3}$ 0apggsscc 001010011$_2$ Bn{ 1 1 0 0 0 1 1 0 } Po

E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ } 84

flip=False

{1, 5, 2}{1, 3, 4}{1, 7, 6}{2, 7, 3}{2, 4, 6}{3, 5, 6}{4, 5, 7}

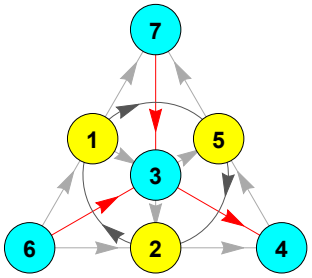
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_5$	e_4	$-e_3$	e_2	$-e_7$	e_6
e_2	e_5	-1	$-e_7$	e_6	$-e_1$	$-e_4$	e_3
e_3	$-e_4$	e_7	-1	e_1	e_6	$-e_5$	$-e_2$
e_4	e_3	$-e_6$	$-e_1$	-1	e_7	e_2	$-e_5$
e_5	$-e_2$	e_1	$-e_6$	$-e_7$	-1	e_3	e_4
e_6	e_7	e_4	e_5	$-e_2$	$-e_3$	-1	$-e_1$
e_7	$-e_6$	$-e_3$	e_2	e_5	$-e_4$	e_1	-1

split=1

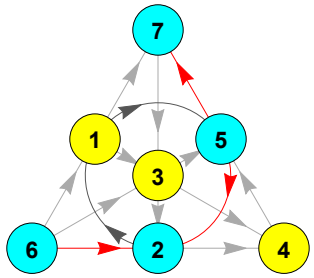
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-5	4	-3	2	-7	6
2	5	-1	-7	6	-1	-4	3
3	-4	7	1	-1	6	5	2
4	3	-6	1	1	7	-2	5
5	-2	1	-6	-7	-1	3	4
6	7	4	-5	2	-3	1	1
7	-6	-3	-2	-5	-4	-1	1

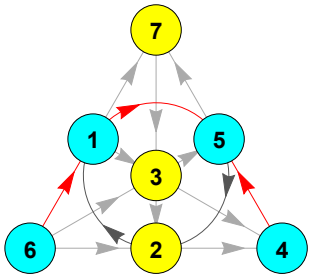
split=2

Fano plane



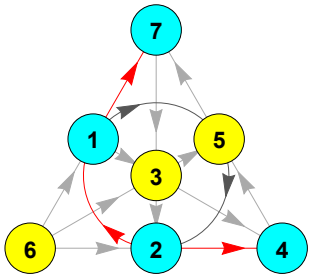
split=4

Fano plane



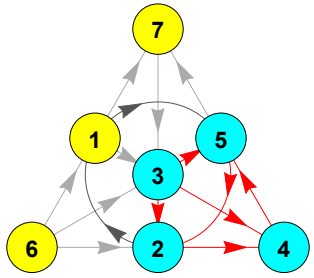
split=6

Fano plane



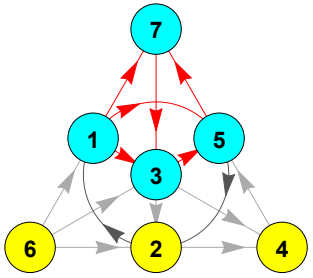
split=3

Fano plane



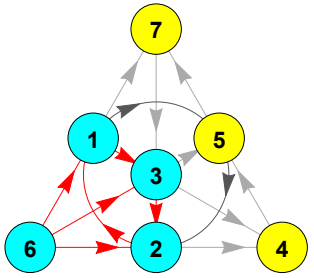
split=5

Fano plane



split=7

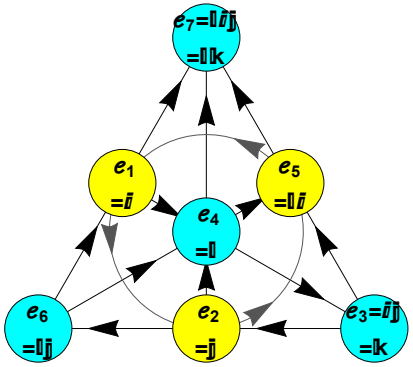
Fano plane



flip=True

{1, 2, 5}{1, 4, 3}{1, 7, 6}{2, 6, 3}{2, 4, 7}{3, 5, 7}{4, 5, 6}

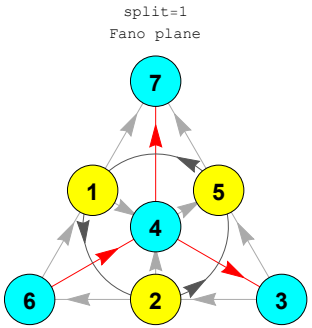
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	$-e_4$	e_3	$-e_2$	$-e_7$	e_6
e_2	$-e_5$	-1	$-e_6$	e_7	e_1	e_3	$-e_4$
e_3	e_4	e_6	-1	$-e_1$	e_7	$-e_2$	$-e_5$
e_4	$-e_3$	$-e_7$	e_1	-1	e_6	$-e_5$	e_2
e_5	e_2	$-e_1$	$-e_7$	$-e_6$	-1	e_4	e_3
e_6	e_7	$-e_3$	e_2	e_5	$-e_4$	-1	$-e_1$
e_7	$-e_6$	e_4	e_5	$-e_2$	$-e_3$	e_1	-1

split=1

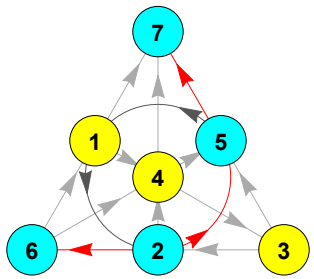
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	-4	3	-2	-7	6
2	-5	-1	-6	7	1	3	-4
3	4	6	1	1	7	2	5
4	-3	-7	-1	1	6	5	-2
5	2	-1	-7	-6	-1	4	3
6	7	-3	-2	-5	-4	1	1
7	-6	4	-5	2	-3	-1	1

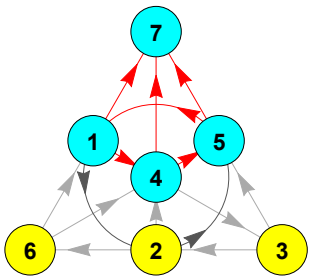
split=2

Fano plane



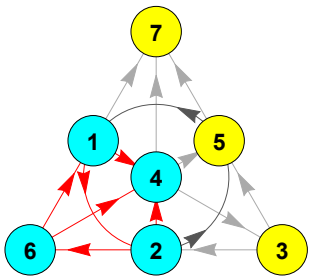
split=4

Fano plane



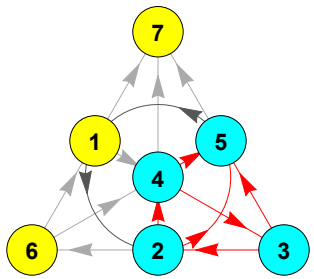
split=6

Fano plane



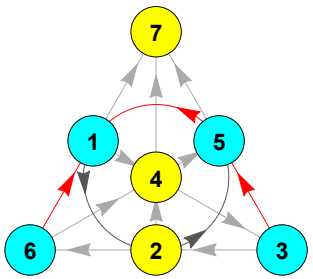
split=3

Fano plane



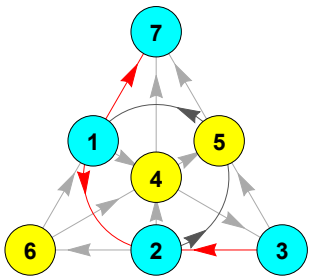
split=5

Fano plane



split=7

Fano plane

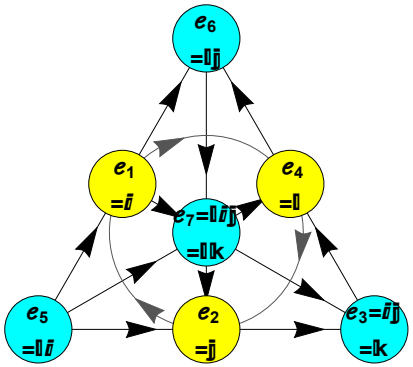


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
107	$u_d^{0\to 2/3}$	■ ◆	0apggsscc 001010010_2	Bn{ 1 1 0 0 0 1 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Eu}$ 63

flip=False

{1, 4, 2}{1, 7, 3}{1, 6, 5}{2, 3, 5}{2, 6, 7}{3, 4, 6}{4, 5, 7}

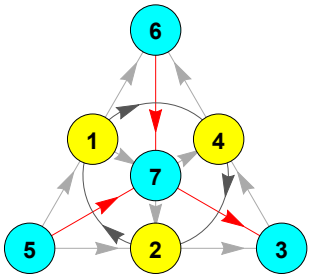
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_7$	e_2	$-e_6$	e_5	e_3
e_2	e_4	−1	e_5	$-e_1$	$-e_3$	e_7	$-e_6$
e_3	e_7	$-e_5$	−1	e_6	e_2	$-e_4$	$-e_1$
e_4	$-e_2$	e_1	$-e_6$	−1	e_7	e_3	$-e_5$
e_5	e_6	e_3	$-e_2$	$-e_7$	−1	$-e_1$	e_4
e_6	$-e_5$	$-e_7$	e_4	$-e_3$	e_1	−1	e_2
e_7	$-e_3$	e_6	e_1	e_5	$-e_4$	$-e_2$	−1

split=1

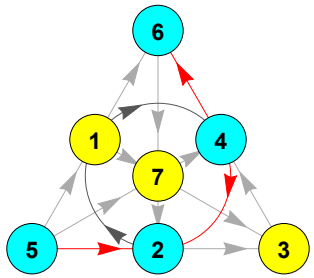
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−7	2	−6	5	3
2	4	−1	5	−1	−3	7	−6
3	7	−5	1	6	−2	4	1
4	−2	1	−6	−1	7	3	−5
5	6	3	2	−7	1	1	−4
6	−5	−7	−4	−3	−1	1	−2
7	−3	6	−1	5	4	2	1

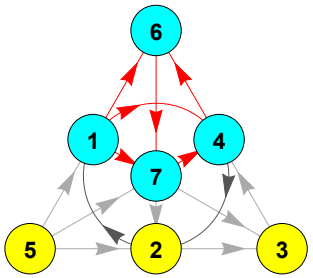
split=2

Fano plane



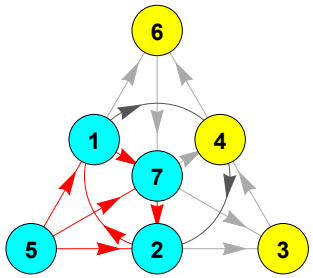
split=4

Fano plane



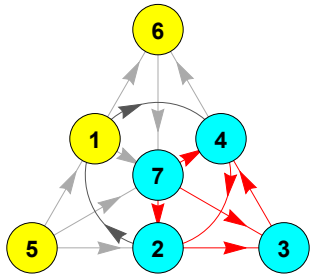
split=6

Fano plane



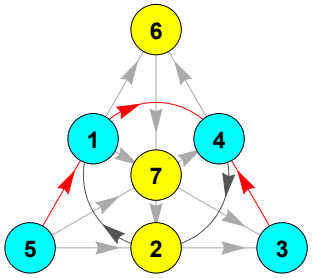
split=3

Fano plane



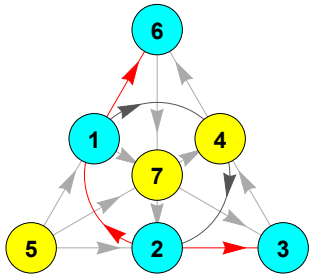
split=5

Fano plane



split=7

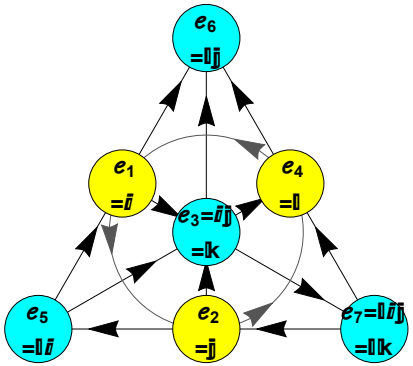
Fano plane



flip=True

{1, 2, 4}{1, 3, 7}{1, 6, 5}{2, 3, 6}{2, 5, 7}{3, 4, 5}{4, 6, 7}

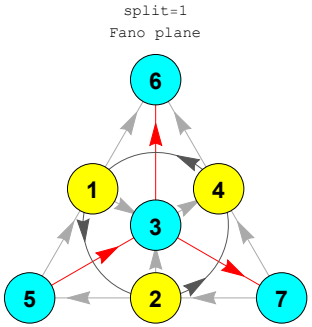
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_7	$-e_2$	$-e_6$	e_5	$-e_3$
e_2	$-e_4$	−1	e_6	e_1	e_7	$-e_3$	$-e_5$
e_3	$-e_7$	$-e_6$	−1	e_5	$-e_4$	e_2	e_1
e_4	e_2	$-e_1$	$-e_5$	−1	e_3	e_7	$-e_6$
e_5	e_6	$-e_7$	e_4	$-e_3$	−1	$-e_1$	e_2
e_6	$-e_5$	e_3	$-e_2$	$-e_7$	e_1	−1	e_4
e_7	e_3	e_5	$-e_1$	e_6	$-e_2$	$-e_4$	−1

split=1

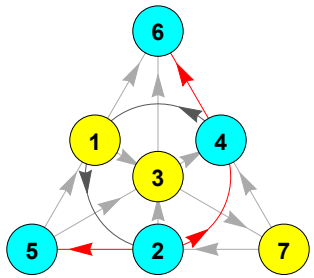
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	7	−2	−6	5	−3
2	−4	−1	6	1	7	−3	−5
3	−7	−6	1	5	4	−2	−1
4	2	−1	−5	−1	3	7	−6
5	6	−7	−4	−3	1	1	−2
6	−5	3	2	−7	−1	1	−4
7	3	5	1	6	2	4	1

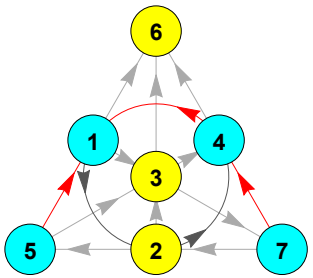
split=2

Fano plane



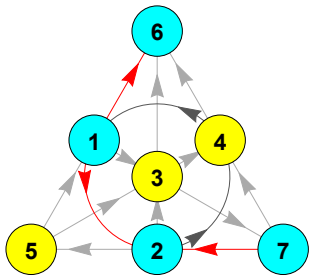
split=4

Fano plane



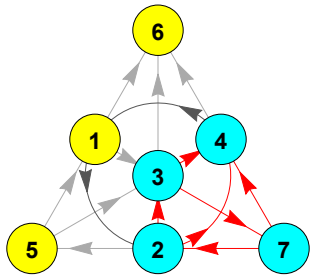
split=6

Fano plane



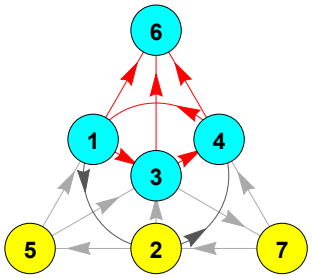
split=3

Fano plane



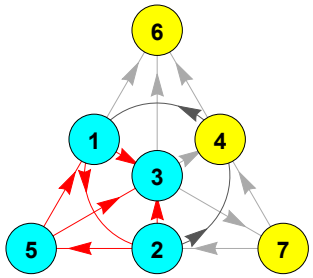
split=5

Fano plane



split=7

Fano plane

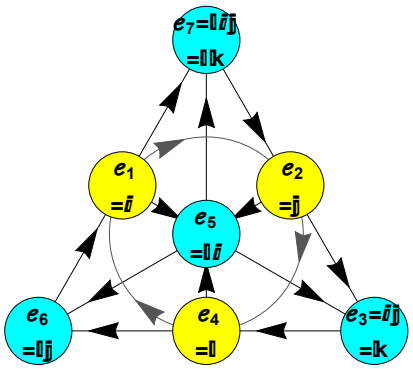


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
108	$u_{r_d}^{0\to 2/3}$		0apggsscc 001010001_2	Bn{ 1 1 0 0 0 0 1 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{Tm}}$ 69

flip=False

{1, 2, 4}{1, 5, 3}{1, 7, 6}{2, 3, 7}{2, 5, 6}{3, 4, 6}{4, 5, 7}

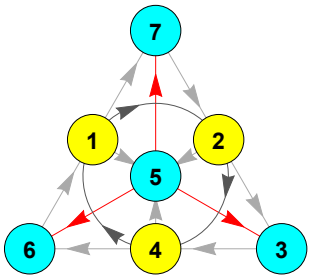
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_5$	$-e_2$	e_3	$-e_7$	e_6
e_2	$-e_4$	−1	e_7	e_1	e_6	$-e_5$	$-e_3$
e_3	e_5	$-e_7$	−1	e_6	$-e_1$	$-e_4$	e_2
e_4	e_2	$-e_1$	$-e_6$	−1	e_7	e_3	$-e_5$
e_5	$-e_3$	$-e_6$	e_1	$-e_7$	−1	e_2	e_4
e_6	e_7	e_5	e_4	$-e_3$	$-e_2$	−1	$-e_1$
e_7	$-e_6$	e_3	$-e_2$	e_5	$-e_4$	e_1	−1

split=1

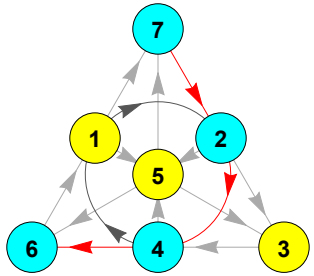
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−5	−2	3	−7	6
2	−4	−1	7	1	6	−5	−3
3	5	−7	1	6	1	4	−2
4	2	−1	−6	−1	7	3	−5
5	−3	−6	−1	−7	1	−2	−4
6	7	5	−4	−3	2	1	1
7	−6	3	2	5	4	−1	1

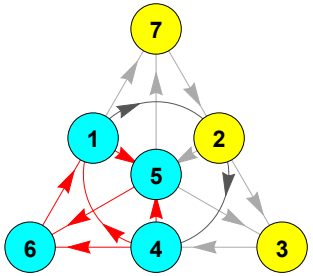
split=2

Fano plane



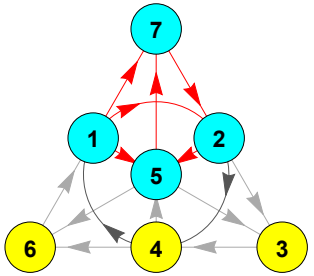
split=4

Fano plane



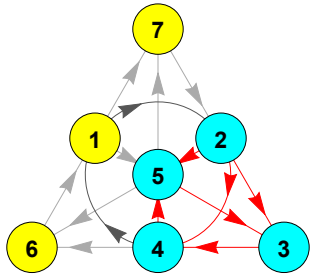
split=6

Fano plane



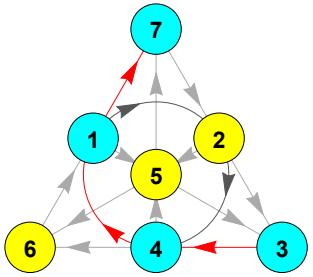
split=3

Fano plane



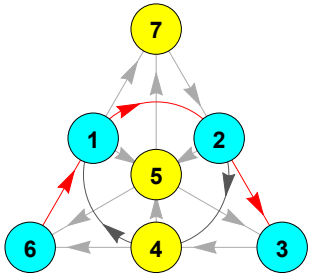
split=5

Fano plane



split=7

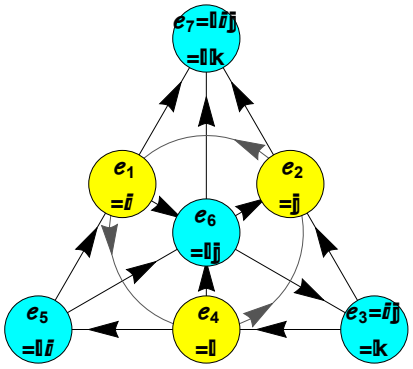
Fano plane



flip=True

{1, 4, 2}{1, 6, 3}{1, 7, 5}{2, 7, 3}{2, 5, 6}{3, 4, 5}{4, 6, 7}

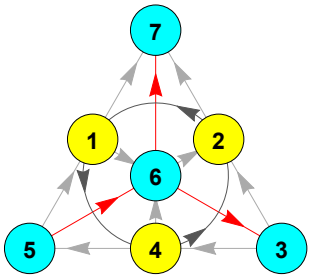
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_6$	e_2	$-e_7$	e_3	e_5
e_2	e_4	−1	$-e_7$	$-e_1$	e_6	$-e_5$	e_3
e_3	e_6	e_7	−1	e_5	$-e_4$	$-e_1$	$-e_2$
e_4	$-e_2$	e_1	$-e_5$	−1	e_3	e_7	$-e_6$
e_5	e_7	$-e_6$	e_4	$-e_3$	−1	e_2	$-e_1$
e_6	$-e_3$	e_5	e_1	$-e_7$	$-e_2$	−1	e_4
e_7	$-e_5$	$-e_3$	e_2	e_6	e_1	$-e_4$	−1

split=1

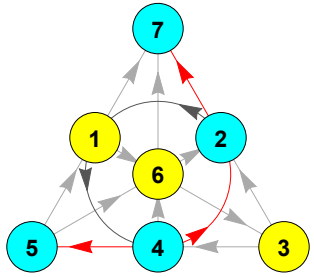
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−6	2	−7	3	5
2	4	−1	−7	−1	6	−5	3
3	6	7	1	5	4	1	2
4	−2	1	−5	−1	3	7	−6
5	7	−6	−4	−3	1	−2	1
6	−3	5	−1	−7	2	1	−4
7	−5	−3	−2	6	−1	4	1

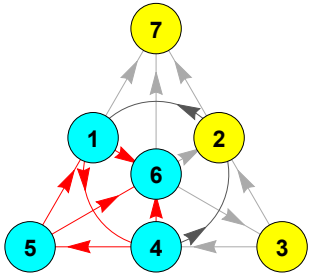
split=2

Fano plane



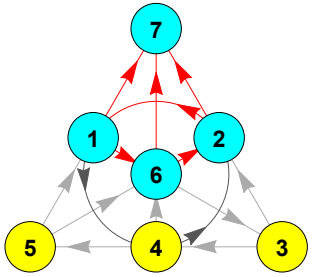
split=4

Fano plane



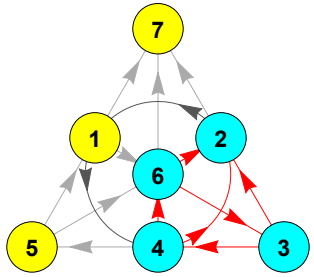
split=6

Fano plane



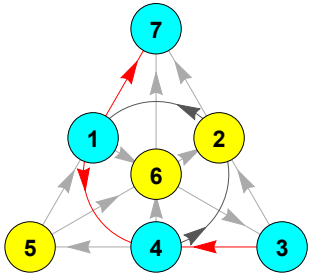
split=3

Fano plane



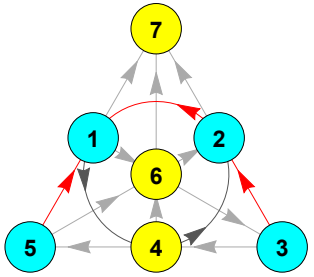
split=5

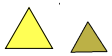
Fano plane



split=7

Fano plane

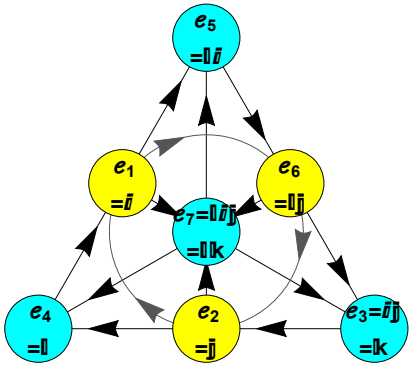


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
109	τ_{y_1}		0apggsscc 000110100_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Pu 94

flip=False

{1, 6, 2}{1, 7, 3}{1, 5, 4}{2, 4, 3}{2, 7, 5}{3, 5, 6}{4, 6, 7}

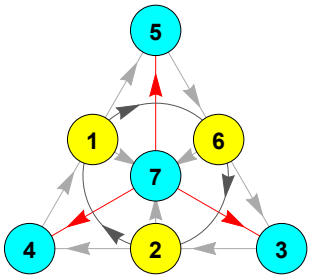
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_7$	$-e_5$	e_4	e_2	e_3
e_2	e_6	−1	$-e_4$	e_3	$-e_7$	$-e_1$	e_5
e_3	e_7	e_4	−1	$-e_2$	e_6	$-e_5$	$-e_1$
e_4	e_5	$-e_3$	e_2	−1	$-e_1$	e_7	$-e_6$
e_5	$-e_4$	e_7	$-e_6$	e_1	−1	e_3	$-e_2$
e_6	$-e_2$	e_1	e_5	$-e_7$	$-e_3$	−1	e_4
e_7	$-e_3$	$-e_5$	e_1	e_6	e_2	$-e_4$	−1

split=1

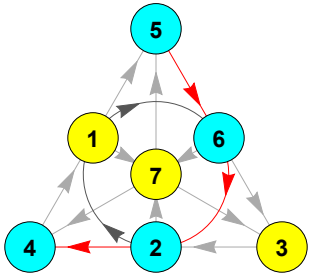
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−7	−5	4	2	3
2	6	−1	−4	3	−7	−1	5
3	7	4	1	2	−6	−5	1
4	5	−3	−2	1	1	7	6
5	−4	7	6	−1	1	3	2
6	−2	1	5	−7	−3	−1	4
7	−3	−5	−1	−6	−2	−4	1

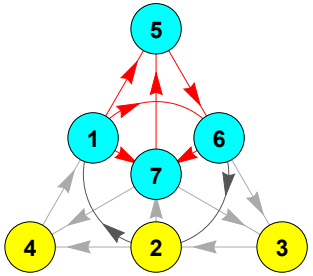
split=2

Fano plane



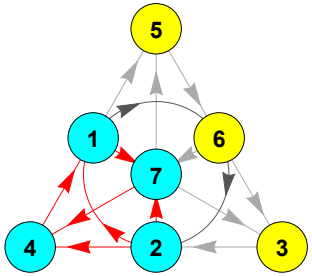
split=4

Fano plane



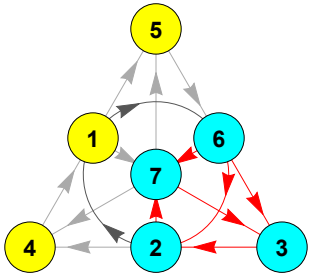
split=6

Fano plane



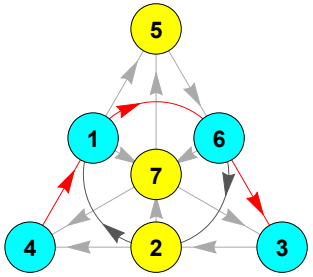
split=3

Fano plane



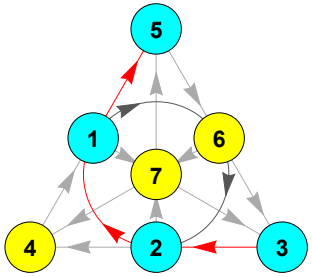
split=5

Fano plane



split=7

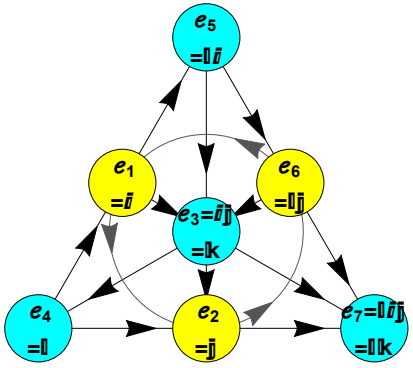
Fano plane



flip=True

{1, 2, 6}{1, 3, 7}{1, 5, 4}{2, 5, 3}{2, 7, 4}{3, 4, 6}{5, 6, 7}

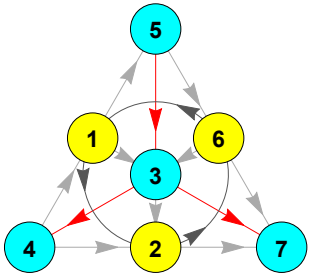
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	e_7	$-e_5$	e_4	$-e_2$	$-e_3$
e_2	$-e_6$	−1	$-e_5$	$-e_7$	e_3	e_1	e_4
e_3	$-e_7$	e_5	−1	e_6	$-e_2$	$-e_4$	e_1
e_4	e_5	e_7	$-e_6$	−1	$-e_1$	e_3	$-e_2$
e_5	$-e_4$	$-e_3$	e_2	e_1	−1	e_7	$-e_6$
e_6	e_2	$-e_1$	e_4	$-e_3$	$-e_7$	−1	e_5
e_7	e_3	$-e_4$	$-e_1$	e_2	e_6	$-e_5$	−1

split=1

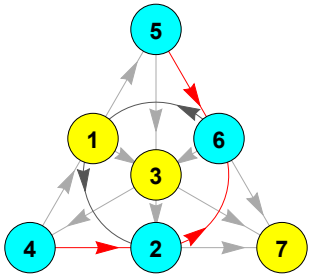
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	7	−5	4	−2	−3
2	−6	−1	−5	−7	3	1	4
3	−7	5	1	−6	2	−4	−1
4	5	7	6	1	1	3	2
5	−4	−3	−2	−1	1	7	6
6	2	−1	4	−3	−7	−1	5
7	3	−4	1	−2	−6	−5	1

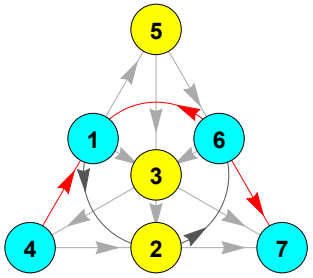
split=2

Fano plane



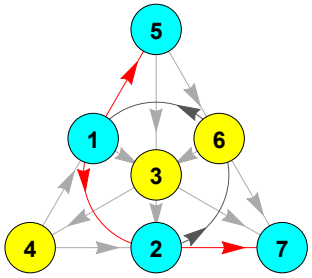
split=4

Fano plane



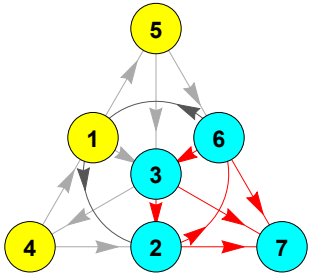
split=6

Fano plane



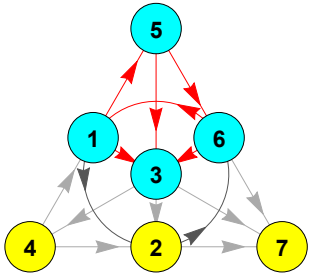
split=3

Fano plane



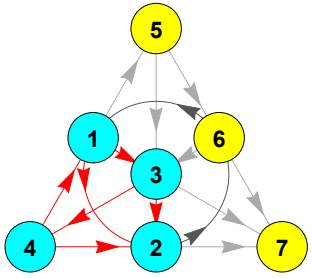
split=5

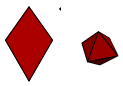
Fano plane



split=7

Fano plane

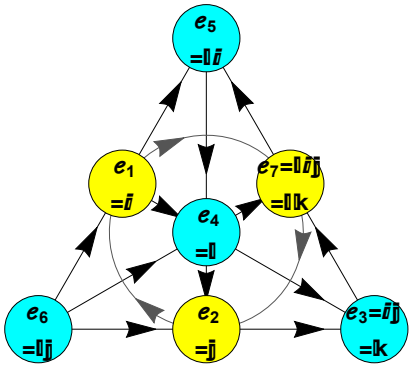


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
110	$\frac{}{t}$ $\frac{}{r_d}$ $\frac{0\to -2/3}{t}$		0apggsscc 0111100001_2	Bn{ 1 0 1 1 0 1 0 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Th 90

flip=False

{1, 7, 2}{1, 4, 3}{1, 5, 6}{2, 3, 6}{2, 5, 4}{3, 7, 5}{4, 7, 6}

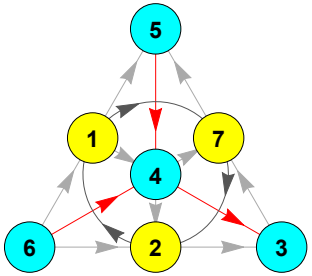
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_4$	e_3	e_6	$-e_5$	e_2
e_2	e_7	−1	e_6	$-e_5$	e_4	$-e_3$	$-e_1$
e_3	e_4	$-e_6$	−1	$-e_1$	$-e_7$	e_2	e_5
e_4	$-e_3$	e_5	e_1	−1	$-e_2$	$-e_7$	e_6
e_5	$-e_6$	$-e_4$	e_7	e_2	−1	e_1	$-e_3$
e_6	e_5	e_3	$-e_2$	e_7	$-e_1$	−1	$-e_4$
e_7	$-e_2$	e_1	$-e_5$	$-e_6$	e_3	e_4	−1

split=1

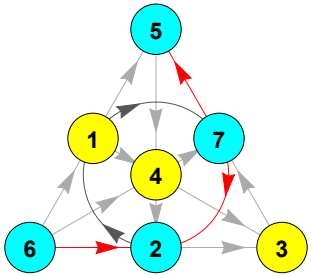
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−4	3	6	−5	2
2	7	−1	6	−5	4	−3	−1
3	4	−6	1	1	7	−2	5
4	−3	5	−1	1	2	7	6
5	−6	−4	−7	−2	1	−1	−3
6	5	3	2	−7	1	1	−4
7	−2	1	−5	−6	3	4	−1

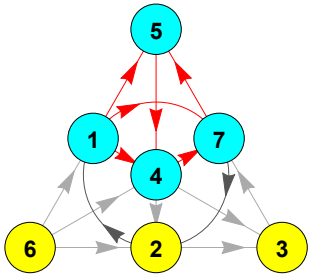
split=2

Fano plane



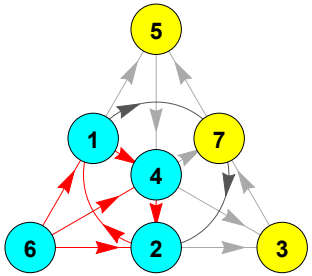
split=4

Fano plane



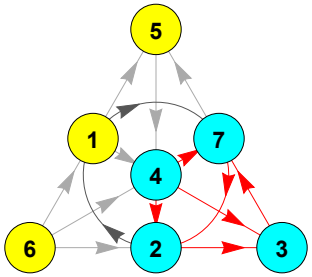
split=6

Fano plane



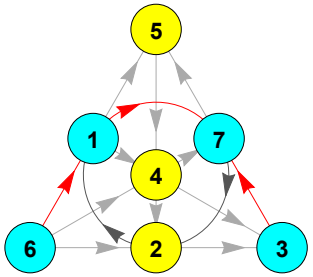
split=3

Fano plane



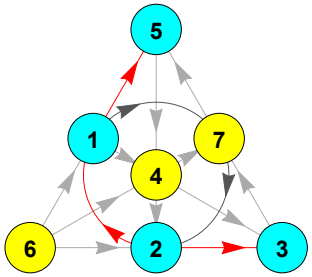
split=5

Fano plane



split=7

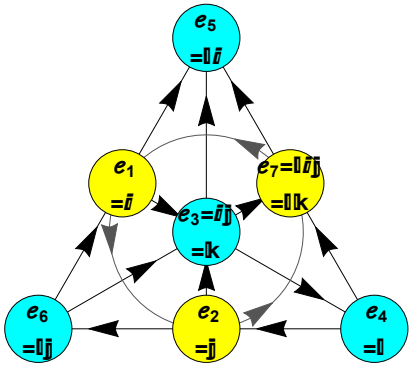
Fano plane



flip=True

{1, 2, 7}{1, 3, 4}{1, 5, 6}{2, 3, 5}{2, 6, 4}{3, 7, 6}{4, 7, 5}

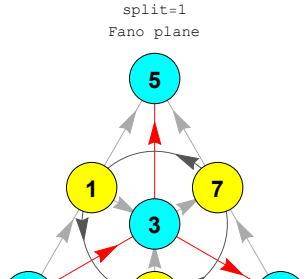
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_4	$-e_3$	e_6	$-e_5$	$-e_2$
e_2	$-e_7$	−1	e_5	$-e_6$	$-e_3$	e_4	e_1
e_3	$-e_4$	$-e_5$	−1	e_1	e_2	$-e_7$	e_6
e_4	e_3	e_6	$-e_1$	−1	$-e_7$	$-e_2$	e_5
e_5	$-e_6$	e_3	$-e_2$	e_7	−1	e_1	$-e_4$
e_6	e_5	$-e_4$	e_7	e_2	$-e_1$	−1	$-e_3$
e_7	e_2	$-e_1$	$-e_6$	$-e_5$	e_4	e_3	−1

split=1

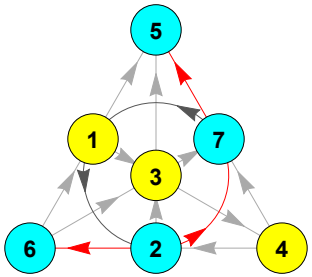
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	4	−3	6	−5	−2
2	−7	−1	5	−6	−3	4	1
3	−4	−5	1	−1	−2	7	6
4	3	6	1	1	7	2	5
5	−6	3	2	−7	1	−1	−4
6	5	−4	−7	−2	1	1	−3
7	2	−1	−6	−5	4	3	−1

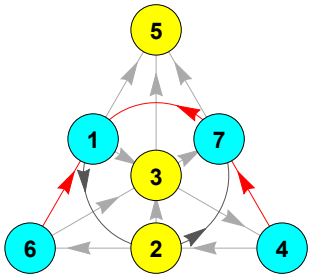
split=2

Fano plane



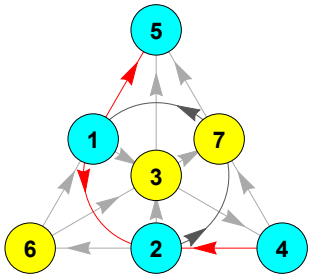
split=4

Fano plane



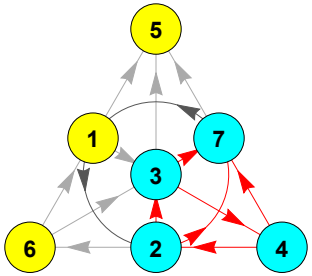
split=6

Fano plane



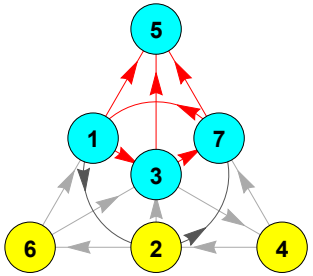
split=3

Fano plane



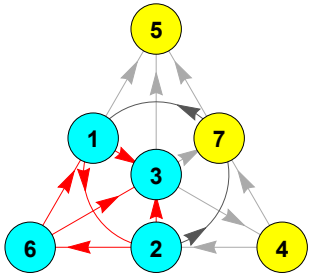
split=5

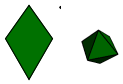
Fano plane



split=7

Fano plane

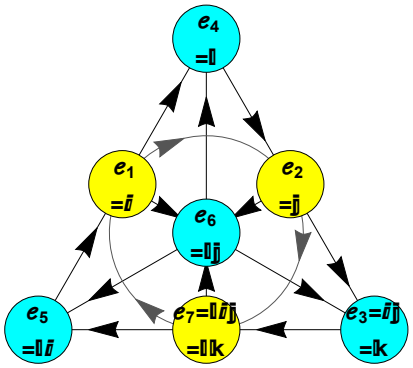


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
111	$\frac{}{g_d}\frac{t}{t}^{0\to -2/3}$		0apggsscc 0111100101_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Fr 87

flip=False

{1, 2, 7}{1, 6, 3}{1, 4, 5}{2, 3, 4}{2, 6, 5}{3, 7, 5}{4, 7, 6}

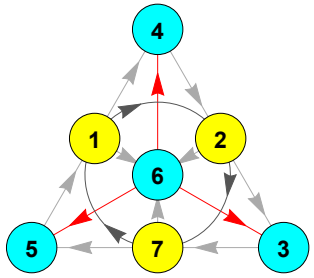
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	$-e_6$	e_5	$-e_4$	e_3	$-e_2$
e_2	e_2	$-e_7$	−1	e_4	$-e_3$	$-e_6$	e_5	e_1
e_3	e_3	e_6	$-e_4$	−1	e_2	$-e_7$	$-e_1$	e_5
e_4	e_4	$-e_5$	e_3	$-e_2$	−1	e_1	$-e_7$	e_6
e_5	e_5	e_4	e_6	e_7	$-e_1$	−1	$-e_2$	$-e_3$
e_6	e_6	$-e_3$	$-e_5$	e_1	e_7	e_2	−1	$-e_4$
e_7	e_7	e_2	$-e_1$	$-e_5$	$-e_6$	e_3	e_4	−1

split=1

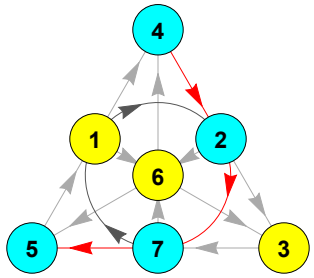
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−6	5	−4	3	−2
2	−7	−1	4	−3	−6	5	1
3	6	−4	1	−2	7	1	5
4	−5	3	2	1	−1	7	6
5	4	6	−7	1	1	2	−3
6	−3	−5	−1	−7	−2	1	−4
7	2	−1	−5	−6	3	4	−1

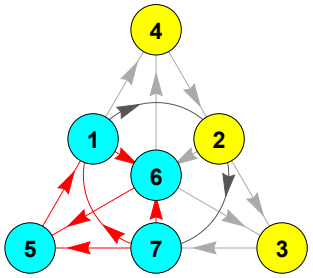
split=2

Fano plane



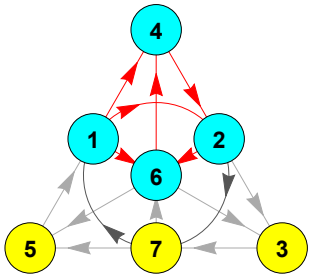
split=4

Fano plane



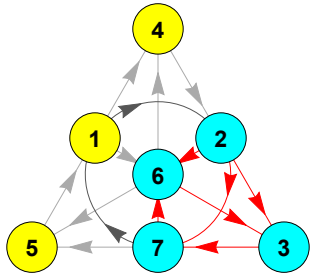
split=6

Fano plane



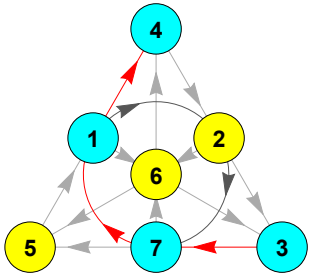
split=3

Fano plane



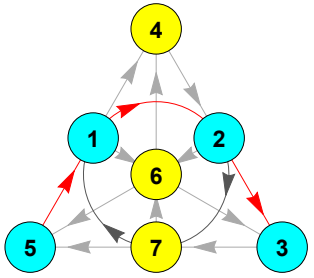
split=5

Fano plane



split=7

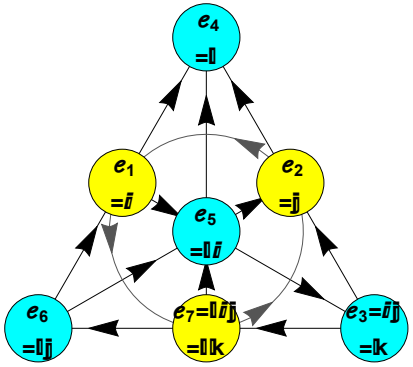
Fano plane



flip=True

{1, 7, 2}{1, 5, 3}{1, 4, 6}{2, 4, 3}{2, 6, 5}{3, 7, 6}{4, 7, 5}

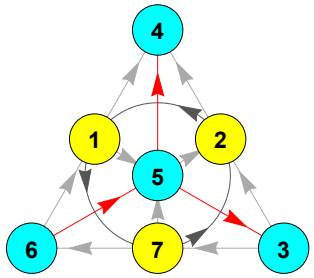
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	$-e_5$	e_6	e_3	$-e_4$	e_2
e_2	e_2	e_7	−1	$-e_4$	e_3	$-e_6$	e_5	$-e_1$
e_3	e_3	e_5	e_4	−1	$-e_2$	$-e_1$	$-e_7$	e_6
e_4	e_4	$-e_6$	$-e_3$	e_2	−1	$-e_7$	e_1	e_5
e_5	e_5	$-e_3$	e_6	e_1	e_7	−1	$-e_2$	$-e_4$
e_6	e_6	e_4	$-e_5$	e_7	$-e_1$	e_2	−1	$-e_3$
e_7	e_7	$-e_2$	e_1	$-e_6$	$-e_5$	e_4	e_3	−1

split=1

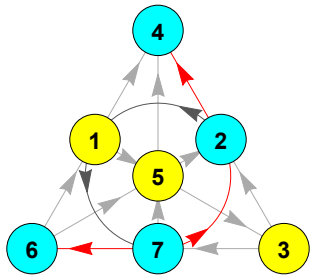
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−5	6	3	−4	2
2	7	−1	−4	3	−6	5	−1
3	5	4	1	2	1	7	6
4	−6	−3	−2	1	7	−1	5
5	−3	6	−1	−7	1	2	−4
6	4	−5	−7	1	−2	1	−3
7	−2	1	−6	−5	4	3	−1

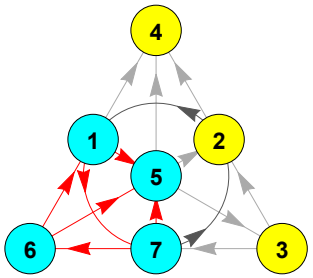
split=2

Fano plane



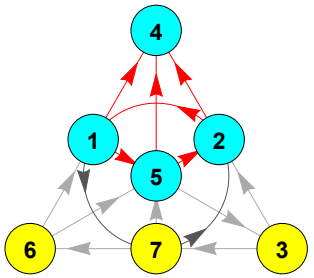
split=4

Fano plane



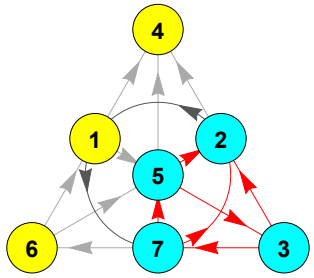
split=6

Fano plane



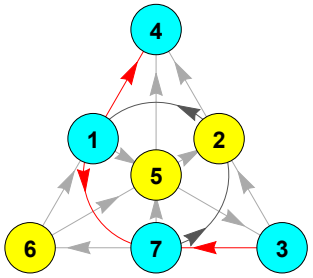
split=3

Fano plane



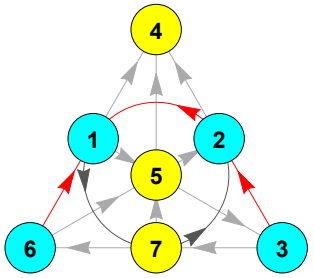
split=5

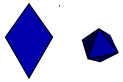
Fano plane



split=7

Fano plane

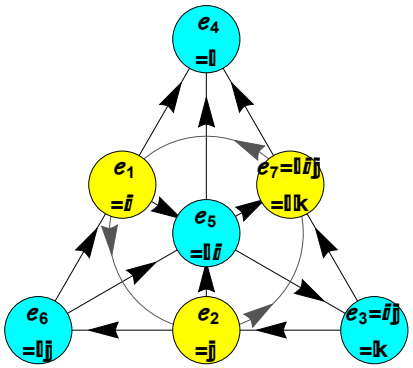


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
112	$\overline{t}_{b_d}^{-2/3}\overline{t}$		0apggsscc 0111100111_2	Bn{ 1 0 1 1 0 0 0 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Ce}$ 58

flip=False

{1, 2, 7}{1, 5, 3}{1, 4, 6}{2, 6, 3}{2, 5, 4}{3, 7, 4}{5, 7, 6}

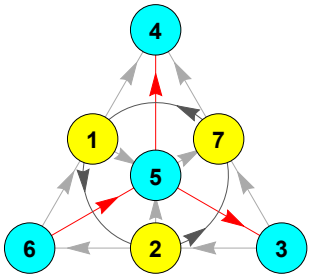
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_5$	e_6	e_3	$-e_4$	$-e_2$
e_2	$-e_7$	−1	$-e_6$	$-e_5$	e_4	e_3	e_1
e_3	e_5	e_6	−1	$-e_7$	$-e_1$	$-e_2$	e_4
e_4	$-e_6$	e_5	e_7	−1	$-e_2$	e_1	$-e_3$
e_5	$-e_3$	$-e_4$	e_1	e_2	−1	$-e_7$	e_6
e_6	e_4	$-e_3$	e_2	$-e_1$	e_7	−1	$-e_5$
e_7	e_2	$-e_1$	$-e_4$	e_3	$-e_6$	e_5	−1

split=1

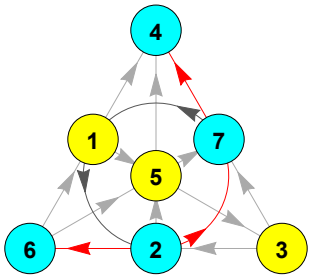
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−5	6	3	−4	−2
2	−7	−1	−6	−5	4	3	1
3	5	6	1	7	1	2	4
4	−6	5	−7	1	2	−1	−3
5	−3	−4	−1	−2	1	7	6
6	4	−3	−2	1	−7	1	−5
7	2	−1	−4	3	−6	5	−1

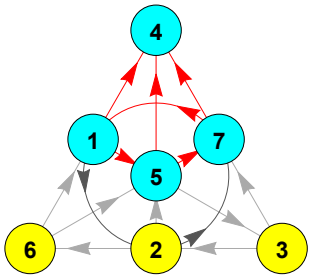
split=2

Fano plane



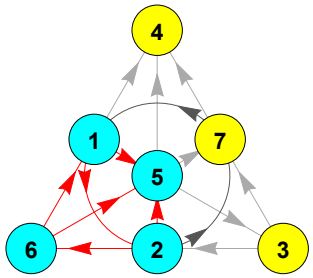
split=4

Fano plane



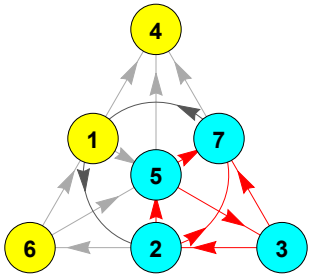
split=6

Fano plane



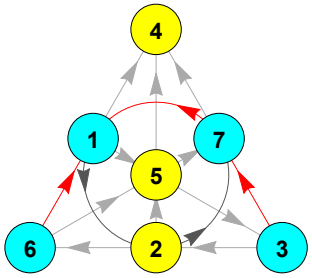
split=3

Fano plane



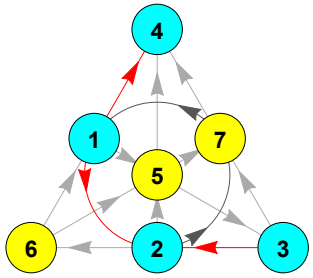
split=5

Fano plane



split=7

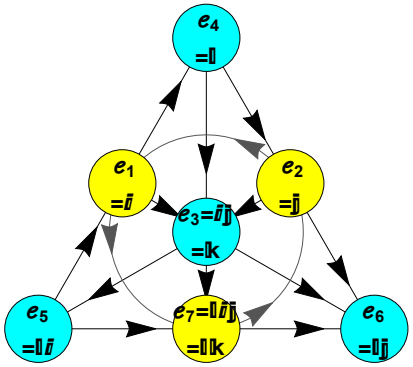
Fano plane



flip=True

{1, 7, 2}{1, 3, 6}{1, 4, 5}{2, 3, 5}{2, 6, 4}{3, 7, 4}{5, 7, 6}

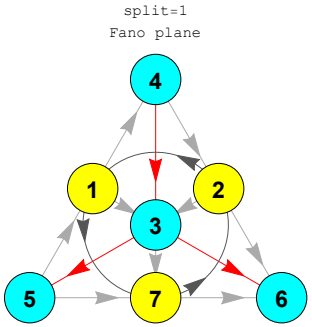
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_6	e_5	$-e_4$	$-e_3$	e_2
e_2	e_7	−1	e_5	$-e_6$	$-e_3$	e_4	$-e_1$
e_3	$-e_6$	$-e_5$	−1	$-e_7$	e_2	e_1	e_4
e_4	$-e_5$	e_6	e_7	−1	e_1	$-e_2$	$-e_3$
e_5	e_4	e_3	$-e_2$	$-e_1$	−1	$-e_7$	e_6
e_6	e_3	$-e_4$	$-e_1$	e_2	e_7	−1	$-e_5$
e_7	$-e_2$	e_1	$-e_4$	e_3	$-e_6$	e_5	−1

split=1

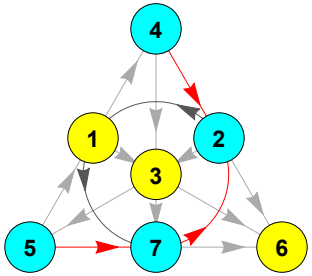
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	6	5	−4	−3	2
2	7	−1	5	−6	−3	4	−1
3	−6	−5	1	7	−2	−1	4
4	−5	6	−7	1	−1	2	−3
5	4	3	2	1	1	7	6
6	3	−4	1	−2	−7	1	−5
7	−2	1	−4	3	−6	5	−1

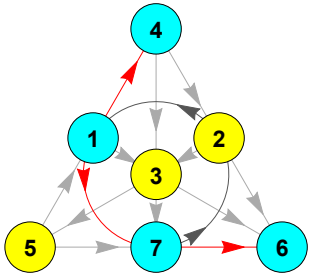
split=2

Fano plane



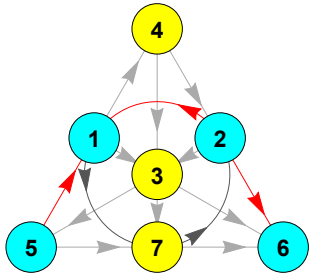
split=4

Fano plane



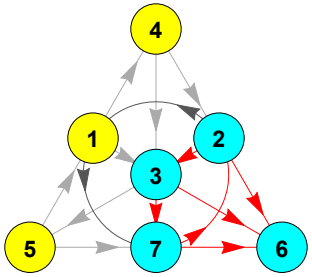
split=6

Fano plane



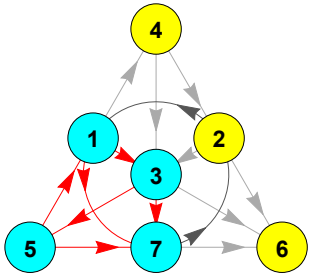
split=3

Fano plane



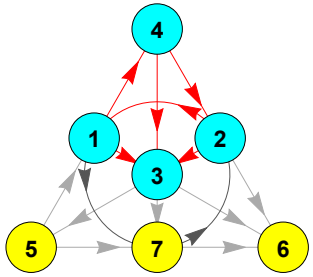
split=5

Fano plane



split=7

Fano plane

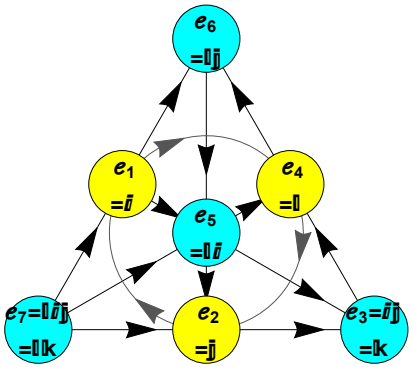


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
113	$\overline{\underset{\text{Om}}{d}}^{\,t\mapsto 1/3}$		0apggsscc 010011001_2	Bn{ 1 0 1 0 1 1 0 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Rn 86

flip=False

{1, 4, 2}{1, 5, 3}{1, 6, 7}{2, 3, 7}{2, 6, 5}{3, 4, 6}{4, 7, 5}

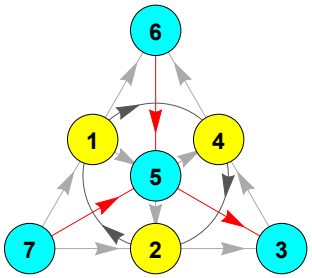
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_5$	e_2	e_3	e_7	$-e_6$
e_2	e_4	−1	e_7	$-e_1$	$-e_6$	e_5	$-e_3$
e_3	e_5	$-e_7$	−1	e_6	$-e_1$	$-e_4$	e_2
e_4	$-e_2$	e_1	$-e_6$	−1	$-e_7$	e_3	e_5
e_5	$-e_3$	e_6	e_1	e_7	−1	$-e_2$	$-e_4$
e_6	$-e_7$	$-e_5$	e_4	$-e_3$	e_2	−1	e_1
e_7	e_6	e_3	$-e_2$	$-e_5$	e_4	$-e_1$	−1

split=1

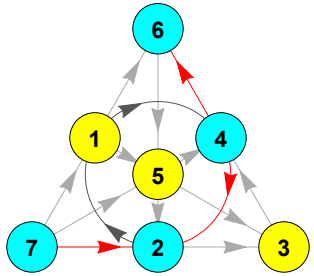
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−5	2	3	7	−6
2	4	−1	7	−1	−6	5	−3
3	5	−7	1	6	1	4	−2
4	−2	1	−6	−1	−7	3	5
5	−3	6	−1	7	1	2	4
6	−7	−5	−4	−3	−2	1	−1
7	6	3	2	−5	−4	1	1

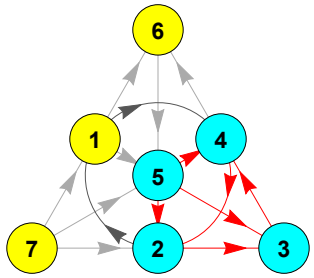
split=2

Fano plane



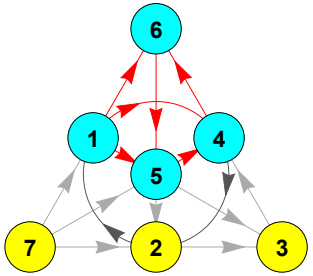
split=3

Fano plane



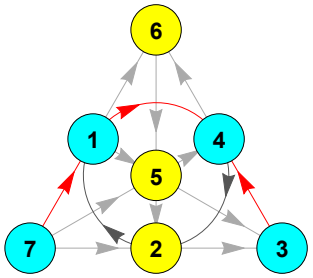
split=4

Fano plane



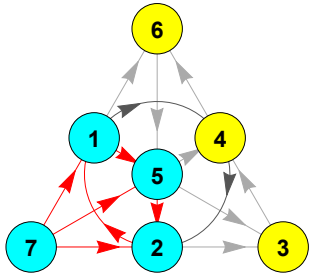
split=5

Fano plane



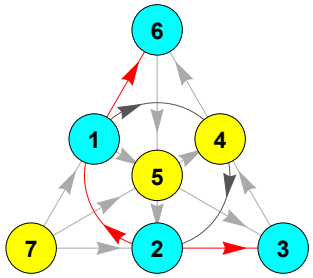
split=6

Fano plane



split=7

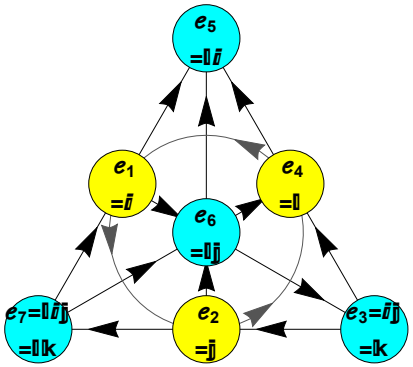
Fano plane



flip=True

{1, 2, 4}{1, 6, 3}{1, 5, 7}{2, 7, 3}{2, 6, 5}{3, 4, 5}{4, 7, 6}

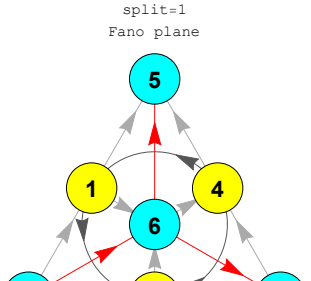
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_6$	$-e_2$	e_7	e_3	$-e_5$
e_2	$-e_4$	−1	$-e_7$	e_1	$-e_6$	e_5	e_3
e_3	e_6	e_7	−1	e_5	$-e_4$	$-e_1$	$-e_2$
e_4	e_2	$-e_1$	$-e_5$	−1	e_3	$-e_7$	e_6
e_5	$-e_7$	e_6	e_4	$-e_3$	−1	$-e_2$	e_1
e_6	$-e_3$	$-e_5$	e_1	e_7	e_2	−1	$-e_4$
e_7	e_5	$-e_3$	e_2	$-e_6$	$-e_1$	e_4	−1

split=1

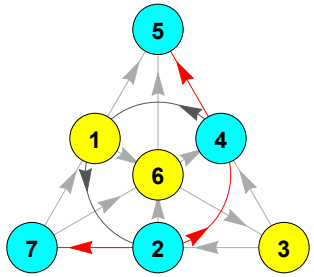
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−6	−2	7	3	−5
2	−4	−1	−7	1	−6	5	3
3	6	7	1	5	4	1	2
4	2	−1	−5	−1	3	−7	6
5	−7	6	−4	−3	1	2	−1
6	−3	−5	−1	7	−2	1	4
7	5	−3	−2	−6	1	−4	1

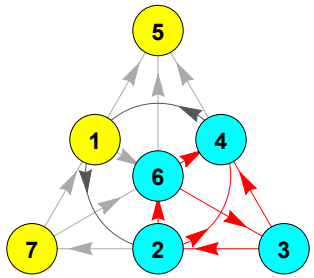
split=2

Fano plane



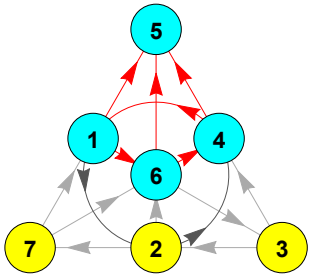
split=3

Fano plane



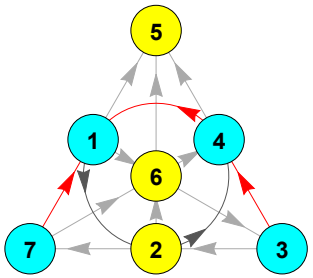
split=4

Fano plane



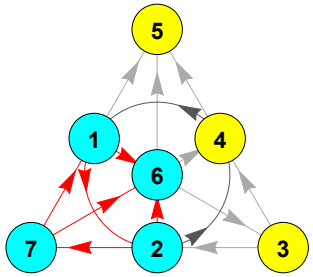
split=5

Fano plane



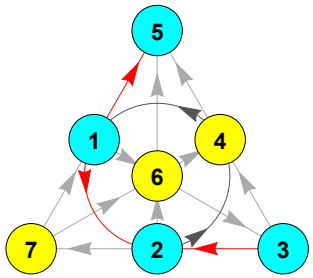
split=6

Fano plane



split=7

Fano plane

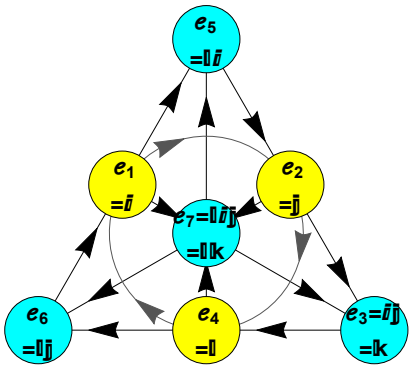


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
114	$\overline{\underset{c_m}{d}}^{\,t\mapsto 1/3}$	◆ ⬟	0apggsscc 0100110101_2	Bn{ 1 0 1 0 1 0 1 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Bi 83

flip=False

{1, 2, 4}{1, 7, 3}{1, 5, 6}{2, 3, 5}{2, 7, 6}{3, 4, 6}{4, 7, 5}

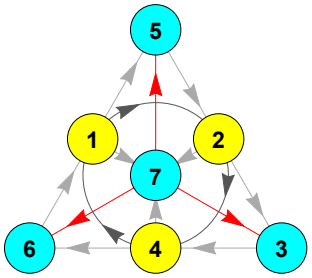
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_7$	$-e_2$	e_6	$-e_5$	e_3
e_2	$-e_4$	−1	e_5	e_1	$-e_3$	$-e_7$	e_6
e_3	e_7	$-e_5$	−1	e_6	e_2	$-e_4$	$-e_1$
e_4	e_2	$-e_1$	$-e_6$	−1	$-e_7$	e_3	e_5
e_5	$-e_6$	e_3	$-e_2$	e_7	−1	e_1	$-e_4$
e_6	e_5	e_7	e_4	$-e_3$	$-e_1$	−1	$-e_2$
e_7	$-e_3$	$-e_6$	e_1	$-e_5$	e_4	e_2	−1

split=1

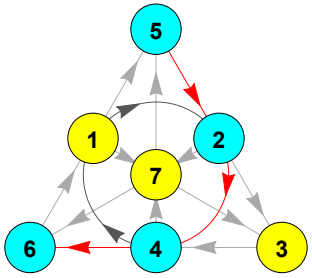
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−7	−2	6	−5	3
2	−4	−1	5	1	−3	−7	6
3	7	−5	1	6	−2	4	1
4	2	−1	−6	−1	−7	3	5
5	−6	3	2	7	1	−1	4
6	5	7	−4	−3	1	1	2
7	−3	−6	−1	−5	−4	−2	1

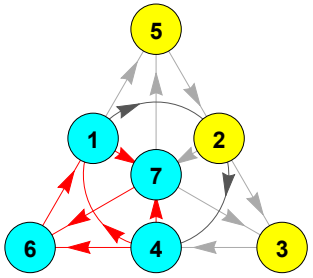
split=2

Fano plane



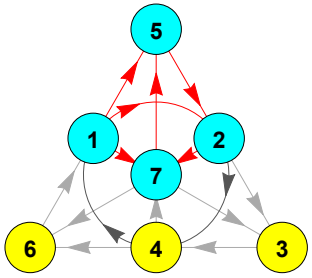
split=4

Fano plane



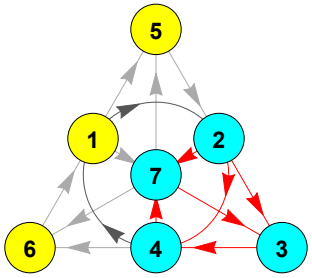
split=6

Fano plane



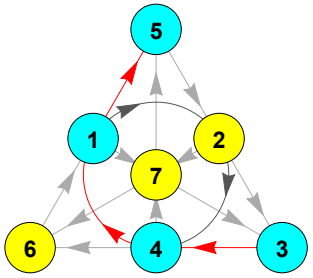
split=3

Fano plane



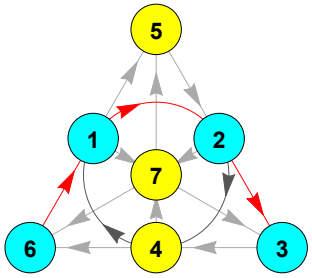
split=5

Fano plane



split=7

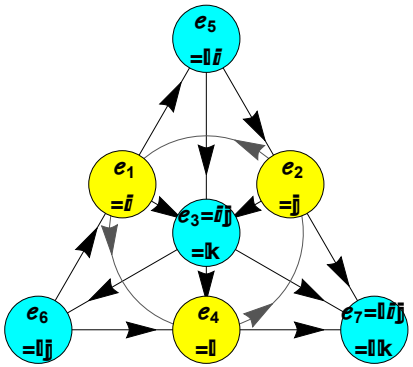
Fano plane



flip=True

{1, 4, 2}{1, 3, 7}{1, 5, 6}{2, 3, 6}{2, 7, 5}{3, 4, 5}{4, 7, 6}

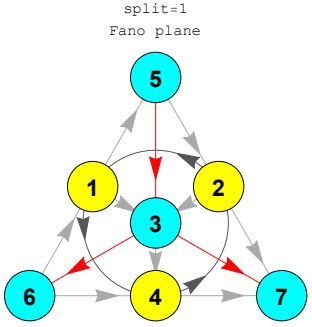
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_7	e_2	e_6	$-e_5$	$-e_3$
e_2	e_4	−1	e_6	$-e_1$	$-e_7$	$-e_3$	e_5
e_3	$-e_7$	$-e_6$	−1	e_5	$-e_4$	e_2	e_1
e_4	$-e_2$	e_1	$-e_5$	−1	e_3	$-e_7$	e_6
e_5	$-e_6$	e_7	e_4	$-e_3$	−1	e_1	$-e_2$
e_6	e_5	e_3	$-e_2$	e_7	$-e_1$	−1	$-e_4$
e_7	e_3	$-e_5$	$-e_1$	$-e_6$	e_2	e_4	−1

split=1

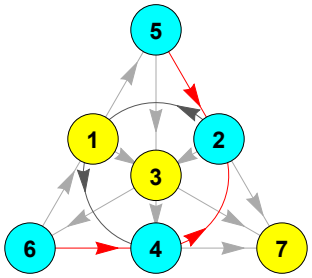
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	7	2	6	−5	−3
2	4	−1	6	−1	−7	−3	5
3	−7	−6	1	5	4	−2	−1
4	−2	1	−5	−1	3	−7	6
5	−6	7	−4	−3	1	−1	2
6	5	3	2	7	1	1	4
7	3	−5	1	−6	−2	−4	1

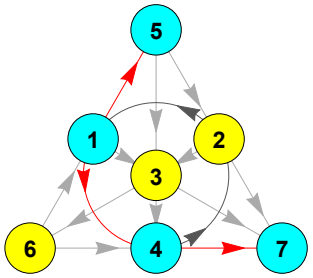
split=2

Fano plane



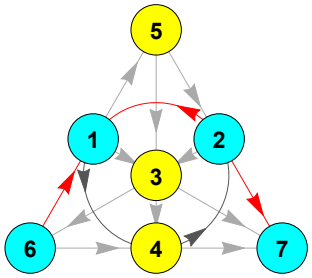
split=4

Fano plane



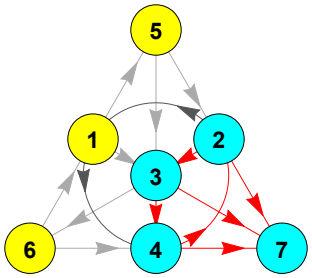
split=6

Fano plane



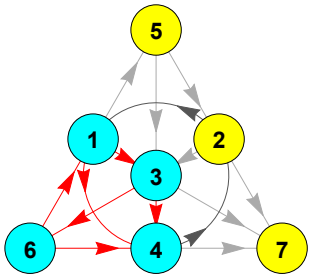
split=3

Fano plane



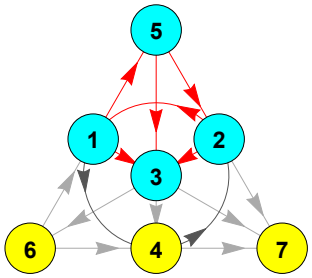
split=5

Fano plane



split=7

Fano plane

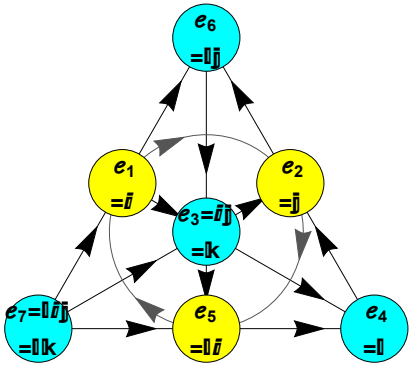


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
115	$\overline{\frac{d}{m}}^{1/3}_{t}$	◆ ⬟	0apggsscc 0100110111_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\overline{Gd}}$ 64

flip=False

{1, 2, 5}{1, 3, 4}{1, 6, 7}{2, 7, 3}{2, 6, 4}{3, 5, 6}{4, 7, 5}

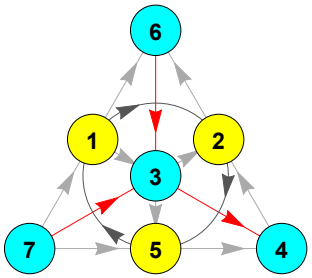
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_4	$-e_3$	$-e_2$	e_7	$-e_6$
e_2	$-e_5$	−1	$-e_7$	$-e_6$	e_1	e_4	e_3
e_3	$-e_4$	e_7	−1	e_1	e_6	$-e_5$	$-e_2$
e_4	e_3	e_6	$-e_1$	−1	$-e_7$	$-e_2$	e_5
e_5	e_2	$-e_1$	$-e_6$	e_7	−1	e_3	$-e_4$
e_6	$-e_7$	$-e_4$	e_5	e_2	$-e_3$	−1	e_1
e_7	e_6	$-e_3$	e_2	$-e_5$	e_4	$-e_1$	−1

split=1

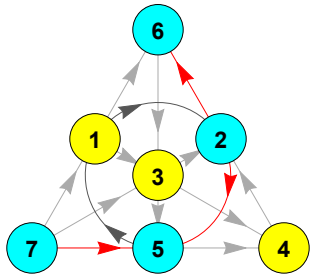
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	4	−3	−2	7	−6
2	−5	−1	−7	−6	1	4	3
3	−4	7	1	−1	6	5	2
4	3	6	1	1	−7	2	−5
5	2	−1	−6	7	−1	3	−4
6	−7	−4	−5	−2	−3	1	−1
7	6	−3	−2	5	4	1	1

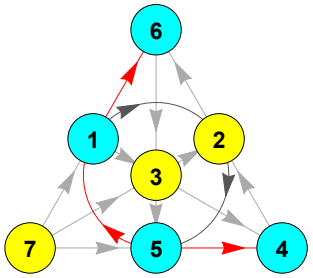
split=2

Fano plane



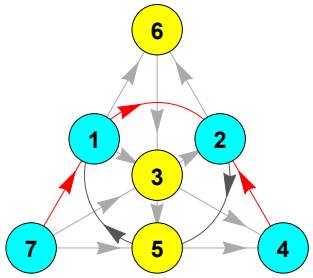
split=4

Fano plane



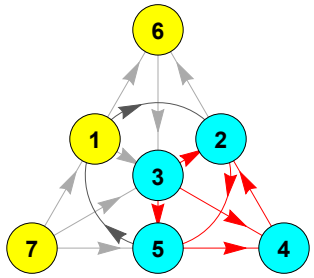
split=6

Fano plane



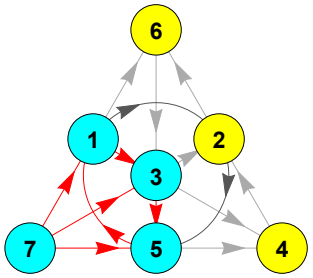
split=3

Fano plane



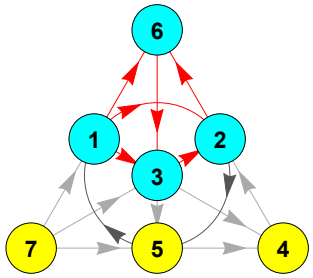
split=5

Fano plane



split=7

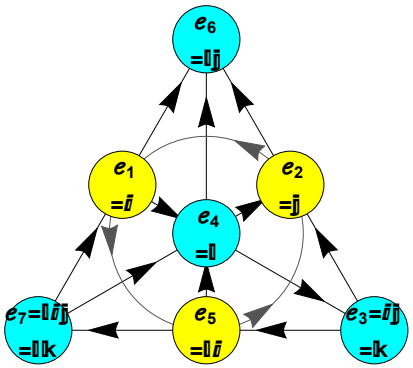
Fano plane



flip=True

{1, 5, 2}{1, 4, 3}{1, 6, 7}{2, 6, 3}{2, 7, 4}{3, 5, 7}{4, 6, 5}

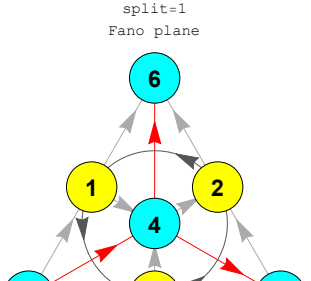
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_4$	e_3	e_2	e_7	$-e_6$
e_2	e_5	−1	$-e_6$	$-e_7$	$-e_1$	e_3	e_4
e_3	e_4	e_6	−1	$-e_1$	e_7	$-e_2$	$-e_5$
e_4	$-e_3$	e_7	e_1	−1	$-e_6$	e_5	$-e_2$
e_5	$-e_2$	e_1	$-e_7$	e_6	−1	$-e_4$	e_3
e_6	$-e_7$	$-e_3$	e_2	$-e_5$	e_4	−1	e_1
e_7	e_6	$-e_4$	e_5	e_2	$-e_3$	$-e_1$	−1

split=1

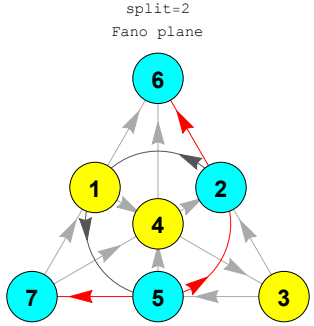
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−4	3	2	7	−6
2	5	−1	−6	−7	−1	3	4
3	4	6	1	1	7	2	5
4	−3	7	−1	1	−6	−5	2
5	−2	1	−7	6	−1	−4	3
6	−7	−3	−2	5	4	1	−1
7	6	−4	−5	−2	−3	1	1

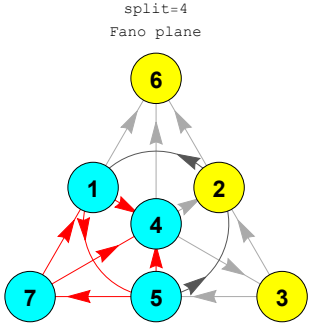
split=2

Fano plane



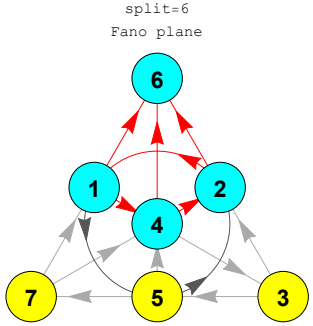
split=4

Fano plane



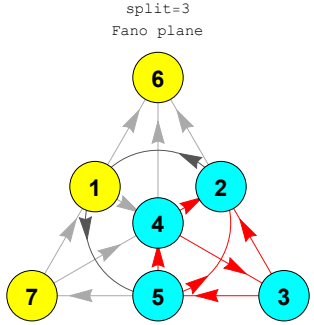
split=6

Fano plane



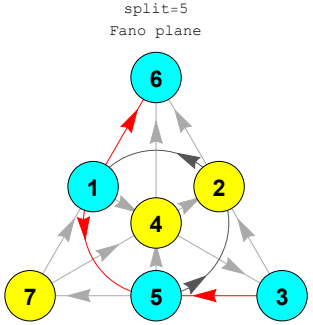
split=3

Fano plane



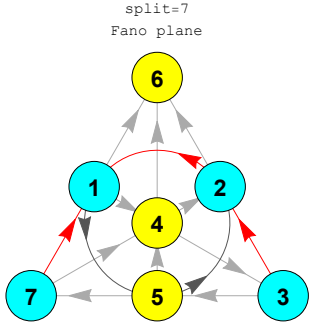
split=5

Fano plane



split=7

Fano plane

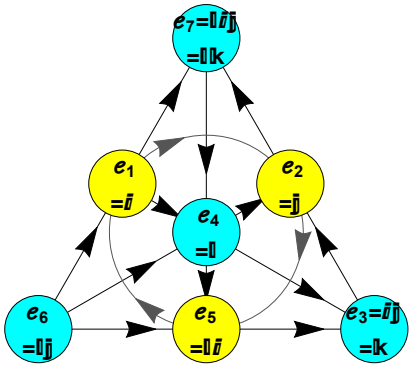


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
116	$u_m^{2/3}$	■ ⬢	0apggsscc 001011111$_2$	Bn{ 1 0 1 0 0 1 1 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Pt 78

flip=False

{1, 2, 5}{1, 4, 3}{1, 7, 6}{2, 7, 3}{2, 6, 4}{3, 6, 5}{4, 5, 7}

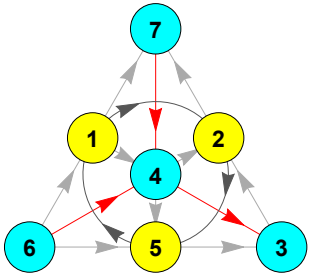
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	$-e_4$	e_3	$-e_2$	$-e_7$	e_6
e_2	$-e_5$	−1	$-e_7$	$-e_6$	e_1	e_4	e_3
e_3	e_4	e_7	−1	$-e_1$	$-e_6$	e_5	$-e_2$
e_4	$-e_3$	e_6	e_1	−1	e_7	$-e_2$	$-e_5$
e_5	e_2	$-e_1$	e_6	$-e_7$	−1	$-e_3$	e_4
e_6	e_7	$-e_4$	$-e_5$	e_2	e_3	−1	$-e_1$
e_7	$-e_6$	$-e_3$	e_2	e_5	$-e_4$	e_1	−1

split=1

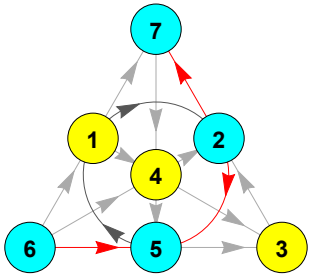
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−4	3	−2	−7	6
2	−5	−1	−7	−6	1	4	3
3	4	7	1	1	−6	−5	2
4	−3	6	−1	1	7	2	5
5	2	−1	6	−7	−1	−3	4
6	7	−4	5	−2	3	1	1
7	−6	−3	−2	−5	−4	−1	1

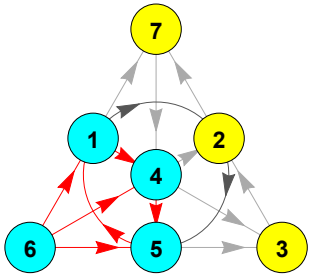
split=2

Fano plane



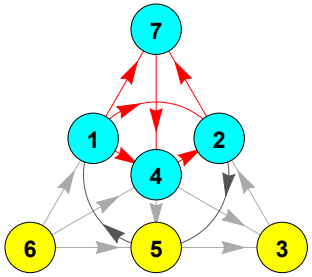
split=4

Fano plane



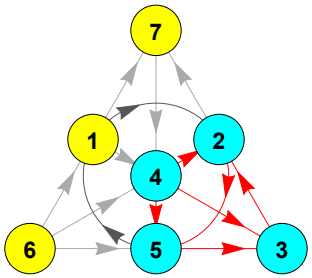
split=6

Fano plane



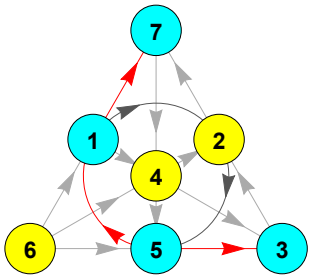
split=3

Fano plane



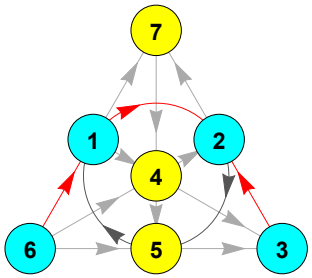
split=5

Fano plane



split=7

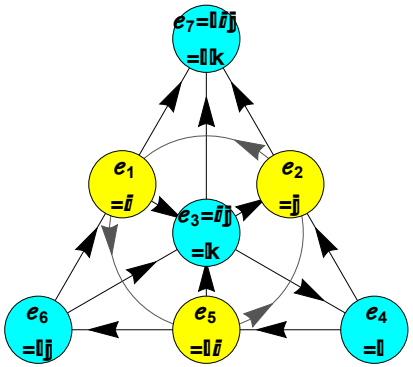
Fano plane



flip=True

{1, 5, 2}{1, 3, 4}{1, 7, 6}{2, 6, 3}{2, 7, 4}{3, 7, 5}{4, 5, 6}

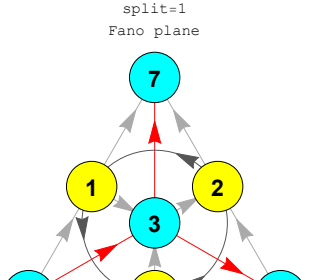
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_4	$-e_3$	e_2	$-e_7$	e_6
e_2	e_5	−1	$-e_6$	$-e_7$	$-e_1$	e_3	e_4
e_3	$-e_4$	e_6	−1	e_1	$-e_7$	$-e_2$	e_5
e_4	e_3	e_7	$-e_1$	−1	e_6	$-e_5$	$-e_2$
e_5	$-e_2$	e_1	e_7	$-e_6$	−1	e_4	$-e_3$
e_6	e_7	$-e_3$	e_2	e_5	$-e_4$	−1	$-e_1$
e_7	$-e_6$	$-e_4$	$-e_5$	e_2	e_3	e_1	−1

split=1

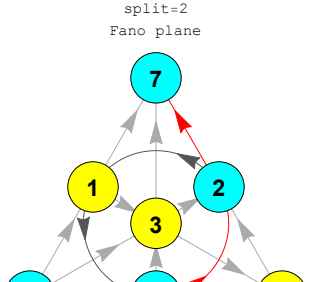
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	4	−3	2	−7	6
2	5	−1	−6	−7	−1	3	4
3	−4	6	1	−1	−7	2	−5
4	3	7	1	1	6	5	2
5	−2	1	7	−6	−1	4	−3
6	7	−3	−2	−5	−4	1	1
7	−6	−4	5	−2	3	−1	1

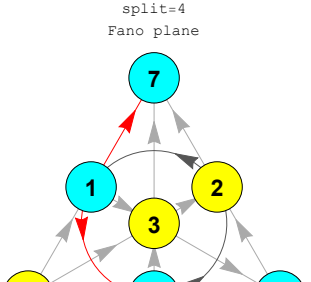
split=2

Fano plane



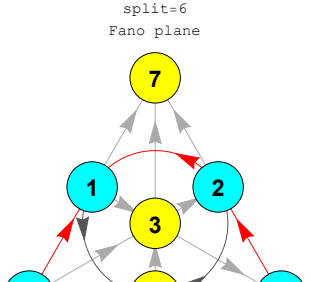
split=4

Fano plane



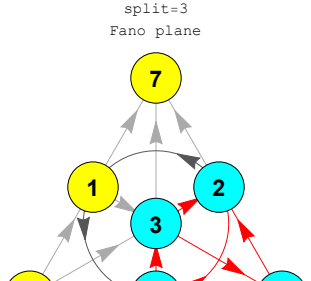
split=6

Fano plane



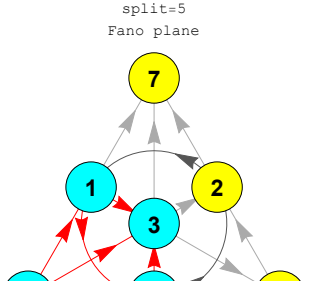
split=3

Fano plane



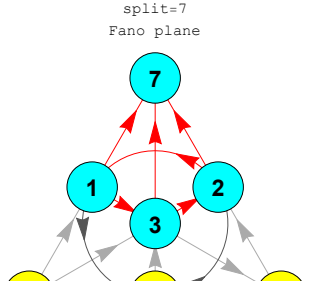
split=5

Fano plane



split=7

Fano plane

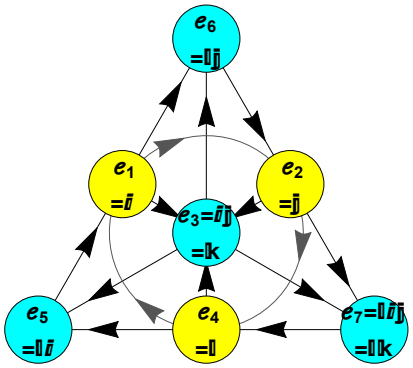


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
117	$u_{gm}^{0\to 2/3}$	■ ◆	0apggsscc 001011110_2	Bn{ 1 0 1 0 0 1 0 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Yb}$ 70

flip=False

{1, 2, 4}{1, 3, 7}{1, 6, 5}{2, 3, 5}{2, 7, 6}{3, 6, 4}{4, 5, 7}

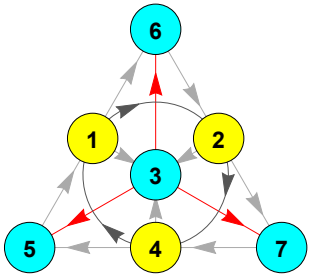
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_7	$-e_2$	$-e_6$	e_5	$-e_3$
e_2	$-e_4$	−1	e_5	e_1	$-e_3$	$-e_7$	e_6
e_3	$-e_7$	$-e_5$	−1	$-e_6$	e_2	e_4	e_1
e_4	e_2	$-e_1$	e_6	−1	e_7	$-e_3$	$-e_5$
e_5	e_6	e_3	$-e_2$	$-e_7$	−1	$-e_1$	e_4
e_6	$-e_5$	e_7	$-e_4$	e_3	e_1	−1	$-e_2$
e_7	e_3	$-e_6$	$-e_1$	e_5	$-e_4$	e_2	−1

split=1

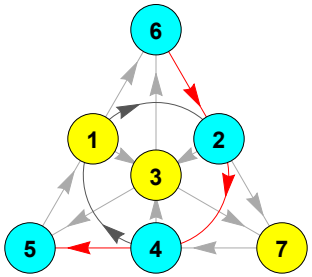
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	7	−2	−6	5	−3
2	−4	−1	5	1	−3	−7	6
3	−7	−5	1	−6	−2	−4	−1
4	2	−1	6	−1	7	−3	−5
5	6	3	2	−7	1	1	−4
6	−5	7	4	3	−1	1	2
7	3	−6	1	5	4	−2	1

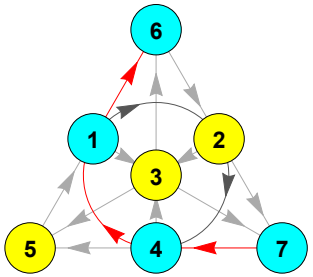
split=2

Fano plane



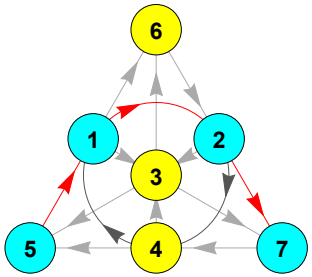
split=4

Fano plane



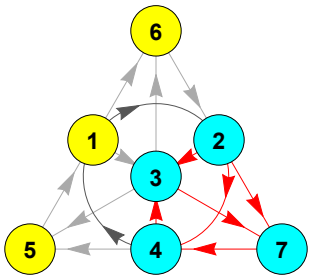
split=6

Fano plane



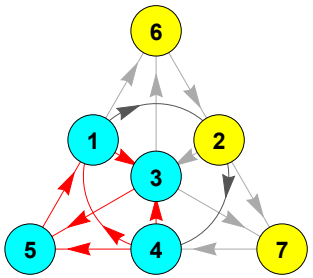
split=3

Fano plane



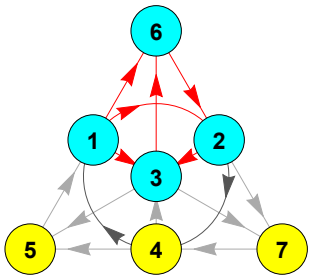
split=5

Fano plane



split=7

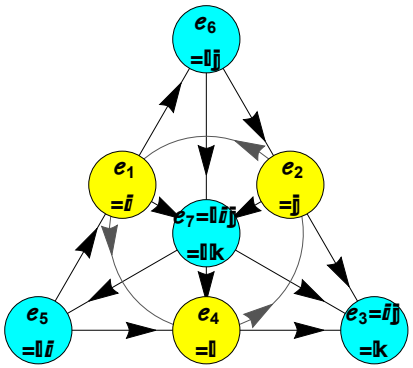
Fano plane



flip=True

{1, 4, 2}{1, 7, 3}{1, 6, 5}{2, 3, 6}{2, 7, 5}{3, 5, 4}{4, 6, 7}

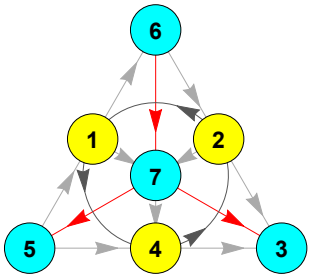
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_7$	e_2	$-e_6$	e_5	e_3
e_2	e_4	−1	e_6	$-e_1$	$-e_7$	$-e_3$	e_5
e_3	e_7	$-e_6$	−1	$-e_5$	e_4	e_2	$-e_1$
e_4	$-e_2$	e_1	e_5	−1	$-e_3$	e_7	$-e_6$
e_5	e_6	e_7	$-e_4$	e_3	−1	$-e_1$	$-e_2$
e_6	$-e_5$	e_3	$-e_2$	$-e_7$	e_1	−1	e_4
e_7	$-e_3$	$-e_5$	e_1	e_6	e_2	$-e_4$	−1

split=1

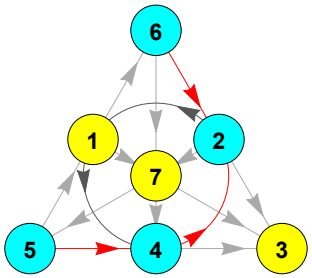
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−7	2	−6	5	3
2	4	−1	6	−1	−7	−3	5
3	7	−6	1	−5	−4	−2	1
4	−2	1	5	−1	−3	7	−6
5	6	7	4	3	1	1	2
6	−5	3	2	−7	−1	1	−4
7	−3	−5	−1	6	−2	4	1

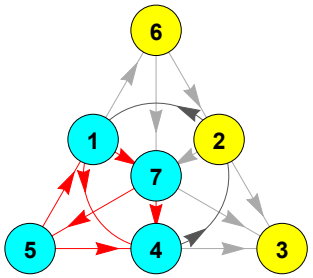
split=2

Fano plane



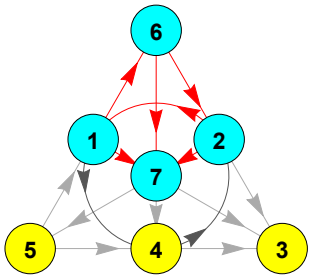
split=4

Fano plane



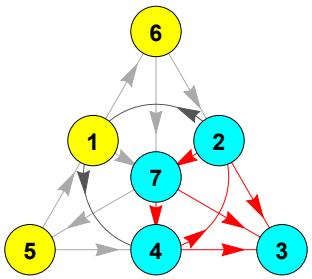
split=6

Fano plane



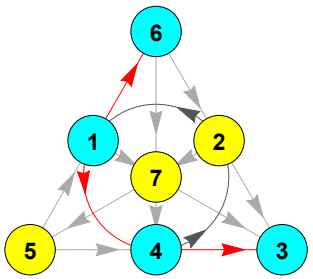
split=3

Fano plane



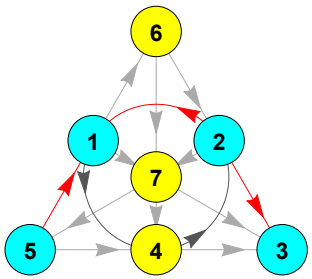
split=5

Fano plane



split=7

Fano plane

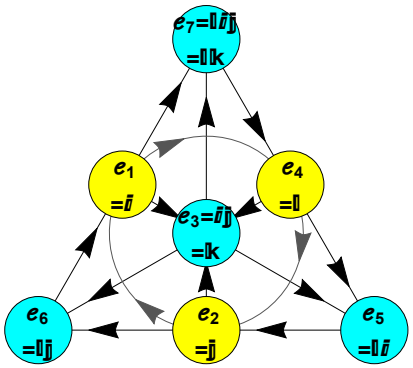


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates	Ele #
118	$\underset{r_m}{u}^{0\to 2/3}_{R}$	■ ■	0apggsscc	0010111011_2	Bn{ 1 0 1 0 0 0 1 1 }	$\overline{\overline{Re}}$
					E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	75

flip=False

{1, 4, 2}{1, 3, 5}{1, 7, 6}{2, 3, 7}{2, 6, 5}{3, 6, 4}{4, 5, 7}

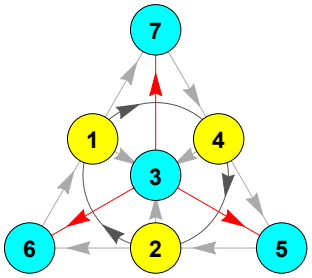
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_5	e_2	$-e_3$	$-e_7$	e_6
e_2	e_4	−1	e_7	$-e_1$	$-e_6$	e_5	$-e_3$
e_3	$-e_5$	$-e_7$	−1	$-e_6$	e_1	e_4	e_2
e_4	$-e_2$	e_1	e_6	−1	e_7	$-e_3$	$-e_5$
e_5	e_3	e_6	$-e_1$	$-e_7$	−1	$-e_2$	e_4
e_6	e_7	$-e_5$	$-e_4$	e_3	e_2	−1	$-e_1$
e_7	$-e_6$	e_3	$-e_2$	e_5	$-e_4$	e_1	−1

split=1

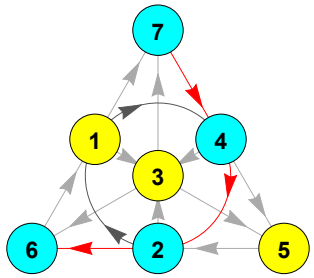
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	5	2	−3	−7	6
2	4	−1	7	−1	−6	5	−3
3	−5	−7	1	−6	−1	−4	−2
4	−2	1	6	−1	7	−3	−5
5	3	6	1	−7	1	2	−4
6	7	−5	4	3	−2	1	1
7	−6	3	2	5	4	−1	1

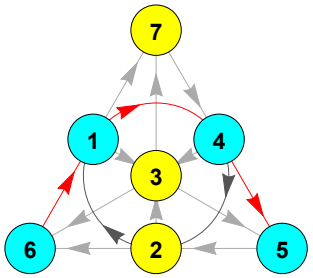
split=2

Fano plane



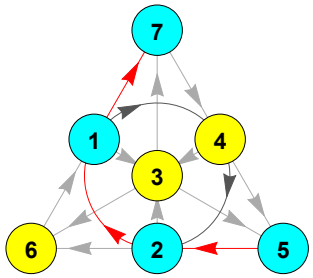
split=4

Fano plane



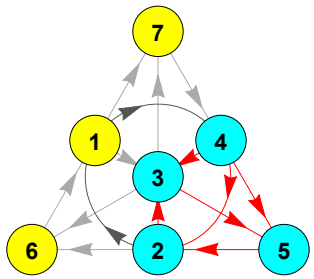
split=6

Fano plane



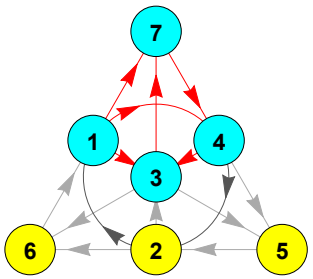
split=3

Fano plane



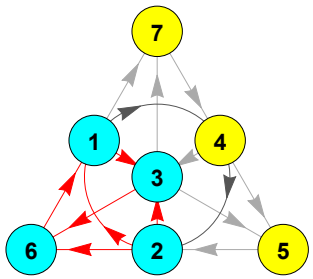
split=5

Fano plane



split=7

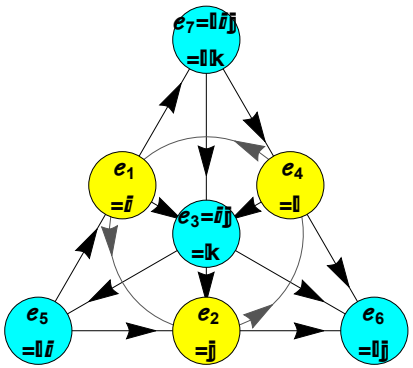
Fano plane



flip=True

{1, 2, 4}{1, 3, 6}{1, 7, 5}{2, 7, 3}{2, 6, 5}{3, 5, 4}{4, 6, 7}

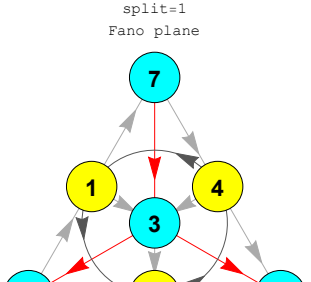
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_6	$-e_2$	$-e_7$	$-e_3$	e_5
e_2	$-e_4$	−1	$-e_7$	e_1	$-e_6$	e_5	e_3
e_3	$-e_6$	e_7	−1	$-e_5$	e_4	e_1	$-e_2$
e_4	e_2	$-e_1$	e_5	−1	$-e_3$	e_7	$-e_6$
e_5	e_7	e_6	$-e_4$	e_3	−1	$-e_2$	$-e_1$
e_6	e_3	$-e_5$	$-e_1$	$-e_7$	e_2	−1	e_4
e_7	$-e_5$	$-e_3$	e_2	e_6	e_1	$-e_4$	−1

split=1

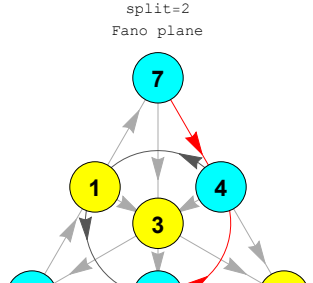
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	6	−2	−7	−3	5
2	−4	−1	−7	1	−6	5	3
3	−6	7	1	−5	−4	−1	2
4	2	−1	5	−1	−3	7	−6
5	7	6	4	3	1	2	1
6	3	−5	1	−7	−2	1	−4
7	−5	−3	−2	6	−1	4	1

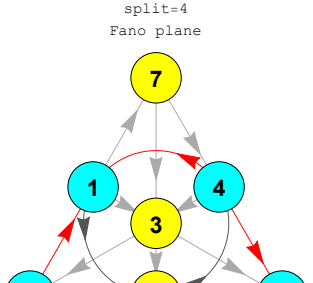
split=2

Fano plane



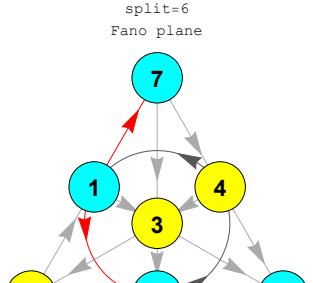
split=4

Fano plane



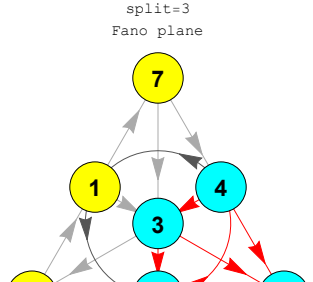
split=6

Fano plane



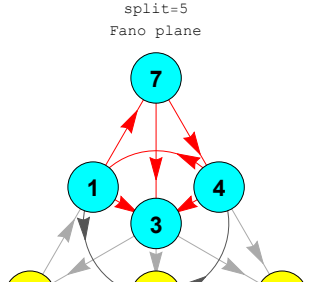
split=3

Fano plane



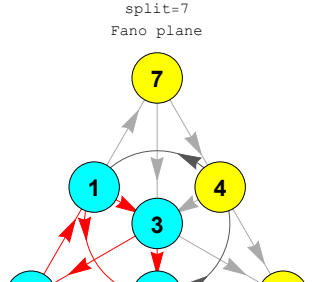
split=5

Fano plane



split=7

Fano plane

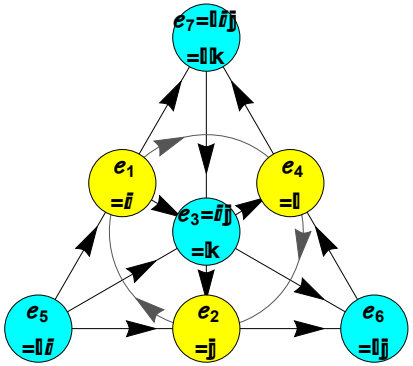


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
119	$\overline{u}_{rm}^{0\to -2/3}$		0apggsscc 0110110011_2	Bn{ 1 0 0 1 1 1 0 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Pb 82

flip=False

{1, 4, 2}{1, 3, 6}{1, 7, 5}{2, 7, 3}{2, 6, 5}{3, 4, 5}{4, 7, 6}

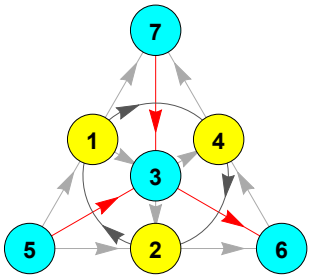
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_6	e_2	$-e_7$	$-e_3$	e_5
e_2	e_4	−1	$-e_7$	$-e_1$	$-e_6$	e_5	e_3
e_3	$-e_6$	e_7	−1	e_5	$-e_4$	e_1	$-e_2$
e_4	$-e_2$	e_1	$-e_5$	−1	e_3	$-e_7$	e_6
e_5	e_7	e_6	e_4	$-e_3$	−1	$-e_2$	$-e_1$
e_6	e_3	$-e_5$	$-e_1$	e_7	e_2	−1	$-e_4$
e_7	$-e_5$	$-e_3$	e_2	$-e_6$	e_1	e_4	−1

split=1

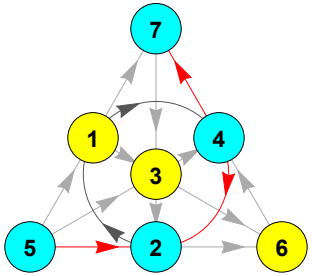
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	6	2	−7	−3	5
2	4	−1	−7	−1	−6	5	3
3	−6	7	1	5	4	−1	2
4	−2	1	−5	−1	3	−7	6
5	7	6	−4	−3	1	2	1
6	3	−5	1	7	−2	1	4
7	−5	−3	−2	−6	−1	−4	1

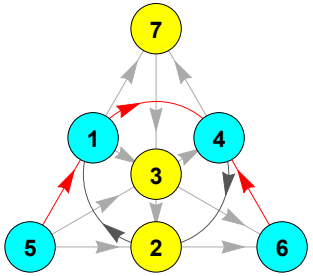
split=2

Fano plane



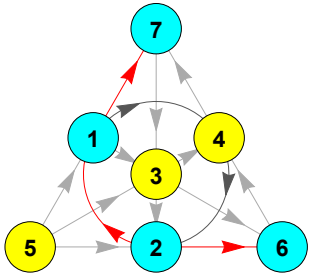
split=4

Fano plane



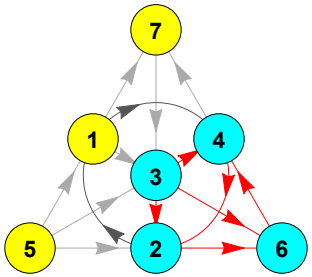
split=6

Fano plane



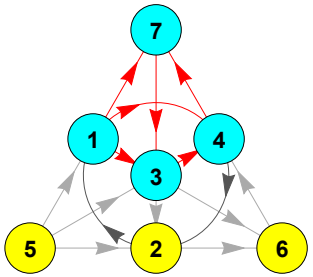
split=3

Fano plane



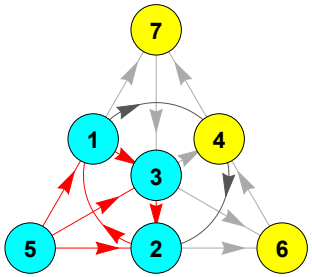
split=5

Fano plane



split=7

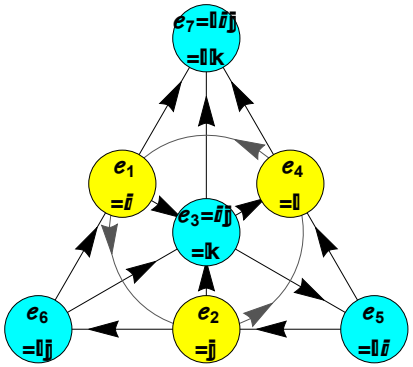
Fano plane



flip=True

{1, 2, 4}{1, 3, 5}{1, 7, 6}{2, 3, 7}{2, 6, 5}{3, 4, 6}{4, 7, 5}

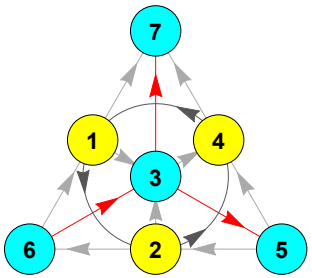
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_5	$-e_2$	$-e_3$	$-e_7$	e_6
e_2	$-e_4$	−1	e_7	e_1	$-e_6$	e_5	$-e_3$
e_3	$-e_5$	$-e_7$	−1	e_6	e_1	$-e_4$	e_2
e_4	e_2	$-e_1$	$-e_6$	−1	$-e_7$	e_3	e_5
e_5	e_3	e_6	$-e_1$	e_7	−1	$-e_2$	$-e_4$
e_6	e_7	$-e_5$	e_4	$-e_3$	e_2	−1	$-e_1$
e_7	$-e_6$	e_3	$-e_2$	$-e_5$	e_4	e_1	−1

split=1

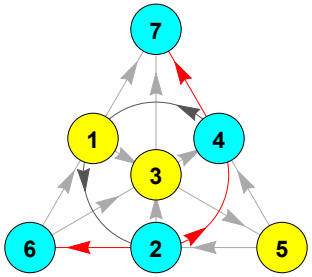
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	5	−2	−3	−7	6
2	−4	−1	7	1	−6	5	−3
3	−5	−7	1	6	−1	4	−2
4	2	−1	−6	−1	−7	3	5
5	3	6	1	7	1	2	4
6	7	−5	−4	−3	−2	1	1
7	−6	3	2	−5	−4	−1	1

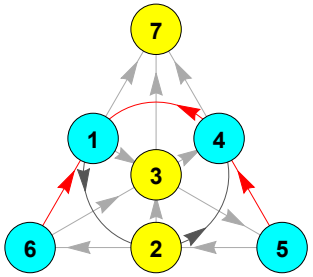
split=2

Fano plane



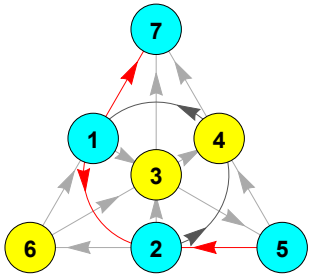
split=4

Fano plane



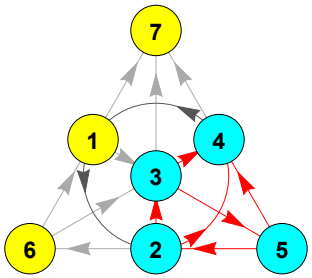
split=6

Fano plane



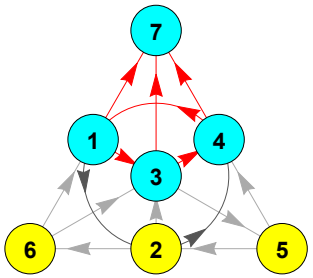
split=3

Fano plane



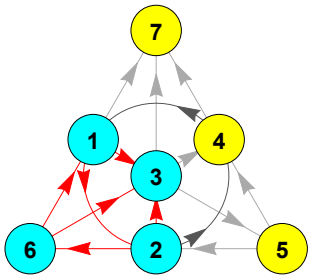
split=5

Fano plane



split=7

Fano plane

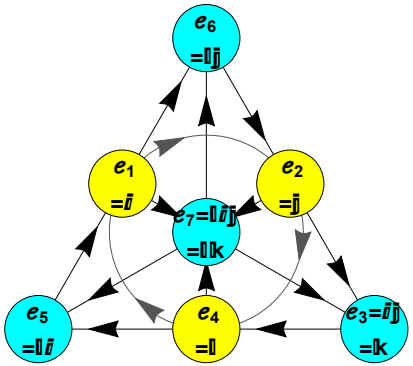


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
120	$\overline{\underset{9m}{u}}^{0\mapsto -2/3}_{L}$		0apggsscc 0110110010_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Ir 77

flip=False

{1, 2, 4}{1, 7, 3}{1, 6, 5}{2, 3, 6}{2, 7, 5}{3, 4, 5}{4, 7, 6}

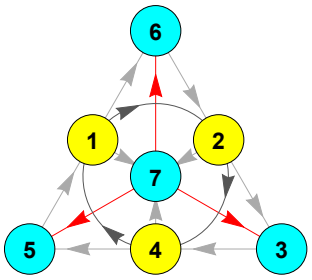
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_7$	$-e_2$	$-e_6$	e_5	e_3
e_2	$-e_4$	−1	e_6	e_1	$-e_7$	$-e_3$	e_5
e_3	e_7	$-e_6$	−1	e_5	$-e_4$	e_2	$-e_1$
e_4	e_2	$-e_1$	$-e_5$	−1	e_3	$-e_7$	e_6
e_5	e_6	e_7	e_4	$-e_3$	−1	$-e_1$	$-e_2$
e_6	$-e_5$	e_3	$-e_2$	e_7	e_1	−1	$-e_4$
e_7	$-e_3$	$-e_5$	e_1	$-e_6$	e_2	e_4	−1

split=1

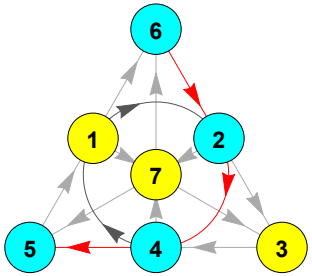
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−7	−2	−6	5	3
2	−4	−1	6	1	−7	−3	5
3	7	−6	1	5	4	−2	1
4	2	−1	−5	−1	3	−7	6
5	6	7	−4	−3	1	1	2
6	−5	3	2	7	−1	1	4
7	−3	−5	−1	−6	−2	−4	1

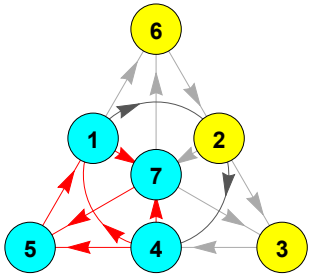
split=2

Fano plane



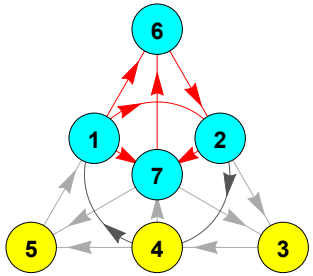
split=4

Fano plane



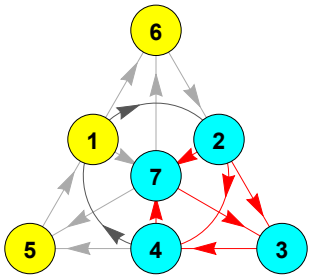
split=6

Fano plane



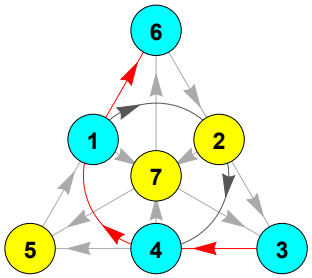
split=3

Fano plane



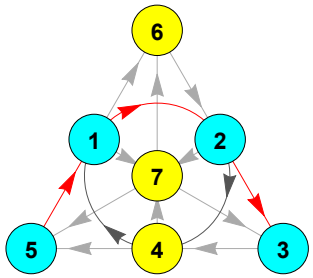
split=5

Fano plane



split=7

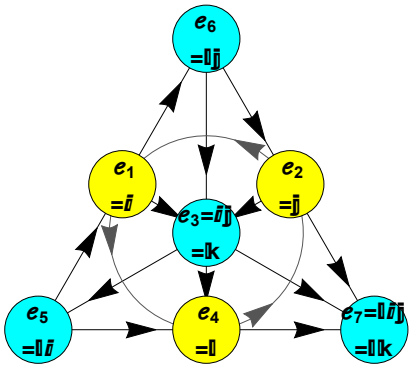
Fano plane



flip=True

{1, 4, 2}{1, 3, 7}{1, 6, 5}{2, 3, 5}{2, 7, 6}{3, 4, 6}{4, 7, 5}

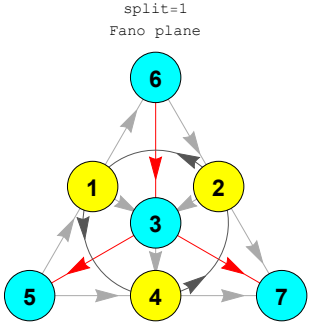
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_7	e_2	$-e_6$	e_5	$-e_3$
e_2	e_4	−1	e_5	$-e_1$	$-e_3$	$-e_7$	e_6
e_3	$-e_7$	$-e_5$	−1	e_6	e_2	$-e_4$	e_1
e_4	$-e_2$	e_1	$-e_6$	−1	$-e_7$	e_3	e_5
e_5	e_6	e_3	$-e_2$	e_7	−1	$-e_1$	$-e_4$
e_6	$-e_5$	e_7	e_4	$-e_3$	e_1	−1	$-e_2$
e_7	e_3	$-e_6$	$-e_1$	$-e_5$	e_4	e_2	−1

split=1

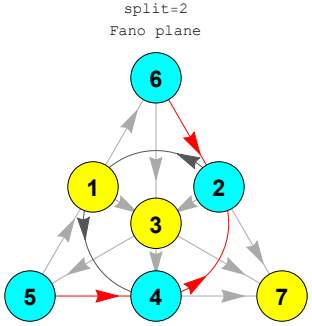
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	7	2	−6	5	−3
2	4	−1	5	−1	−3	−7	6
3	−7	−5	1	6	−2	4	−1
4	−2	1	−6	−1	−7	3	5
5	6	3	2	7	1	1	4
6	−5	7	−4	−3	−1	1	2
7	3	−6	1	−5	−4	−2	1

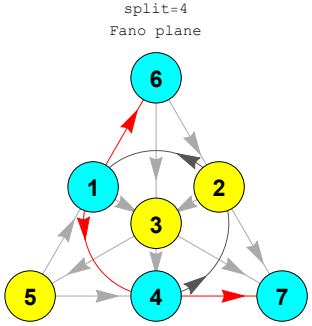
split=2

Fano plane



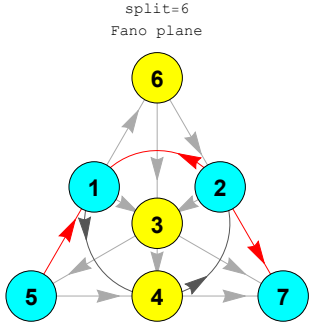
split=4

Fano plane



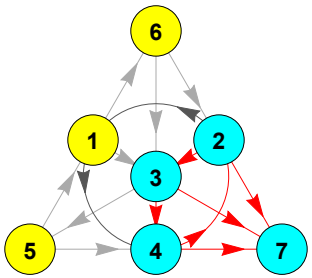
split=6

Fano plane



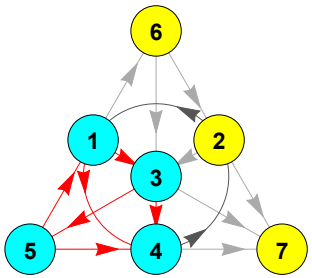
split=3

Fano plane



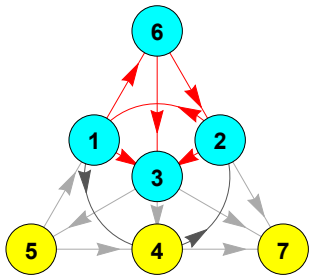
split=5

Fano plane



split=7

Fano plane

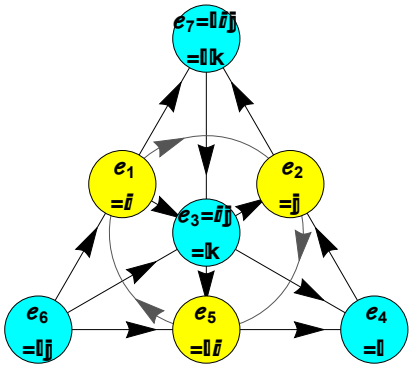


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
121	$\overline{u}_{b_m}{}^{-2/3}$		0apggsscc 011011011_2	Bn{ 1 0 0 1 1 0 0 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Lu}$ 71

flip=False

{1, 2, 5}{1, 3, 4}{1, 7, 6}{2, 6, 3}{2, 7, 4}{3, 5, 7}{4, 6, 5}

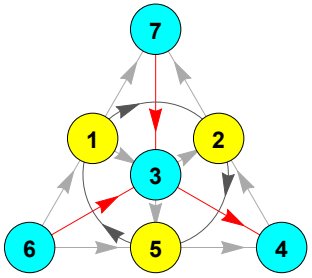
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_4	$-e_3$	$-e_2$	$-e_7$	e_6
e_2	$-e_5$	−1	$-e_6$	$-e_7$	e_1	e_3	e_4
e_3	$-e_4$	e_6	−1	e_1	e_7	$-e_2$	$-e_5$
e_4	e_3	e_7	$-e_1$	−1	$-e_6$	e_5	$-e_2$
e_5	e_2	$-e_1$	$-e_7$	e_6	−1	$-e_4$	e_3
e_6	e_7	$-e_3$	e_2	$-e_5$	e_4	−1	$-e_1$
e_7	$-e_6$	$-e_4$	e_5	e_2	$-e_3$	e_1	−1

split=1

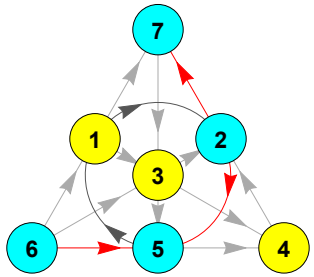
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	4	−3	−2	−7	6
2	−5	−1	−6	−7	1	3	4
3	−4	6	1	−1	7	2	5
4	3	7	1	1	−6	−5	2
5	2	−1	−7	6	−1	−4	3
6	7	−3	−2	5	4	1	1
7	−6	−4	−5	−2	−3	−1	1

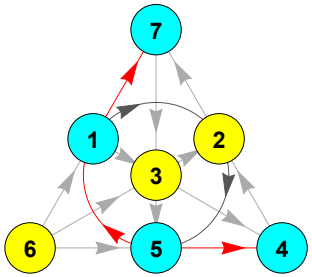
split=2

Fano plane



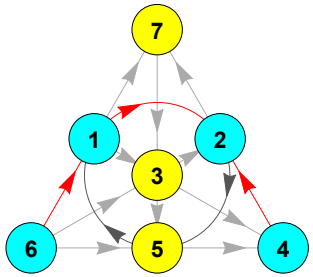
split=4

Fano plane



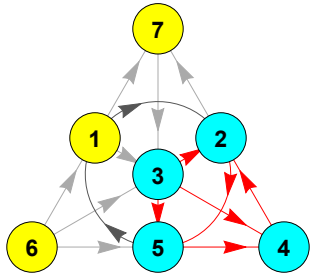
split=6

Fano plane



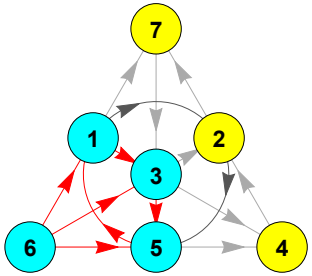
split=3

Fano plane



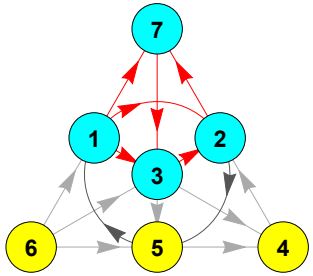
split=5

Fano plane



split=7

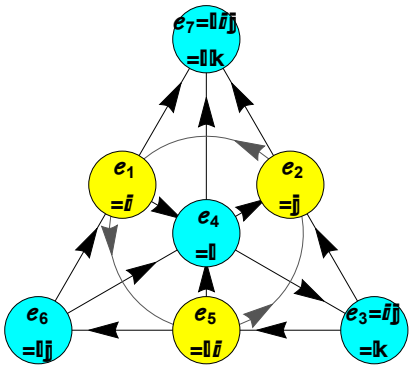
Fano plane



flip=True

{1, 5, 2}{1, 4, 3}{1, 7, 6}{2, 7, 3}{2, 6, 4}{3, 5, 6}{4, 7, 5}

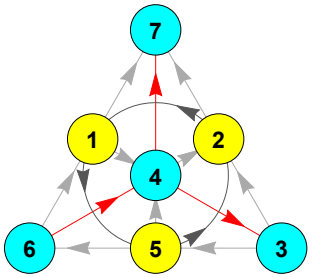
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_4$	e_3	e_2	$-e_7$	e_6
e_2	e_5	−1	$-e_7$	$-e_6$	$-e_1$	e_4	e_3
e_3	e_4	e_7	−1	$-e_1$	e_6	$-e_5$	$-e_2$
e_4	$-e_3$	e_6	e_1	−1	$-e_7$	$-e_2$	e_5
e_5	$-e_2$	e_1	$-e_6$	e_7	−1	e_3	$-e_4$
e_6	e_7	$-e_4$	e_5	e_2	$-e_3$	−1	$-e_1$
e_7	$-e_6$	$-e_3$	e_2	$-e_5$	e_4	e_1	−1

split=1

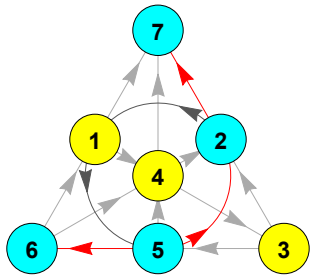
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−4	3	2	−7	6
2	5	−1	−7	−6	−1	4	3
3	4	7	1	1	6	5	2
4	−3	6	−1	1	−7	2	−5
5	−2	1	−6	7	−1	3	−4
6	7	−4	−5	−2	−3	1	1
7	−6	−3	−2	5	4	−1	1

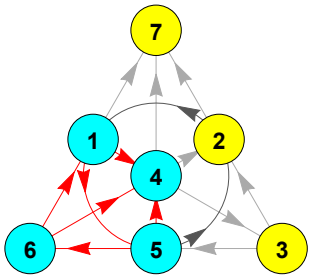
split=2

Fano plane



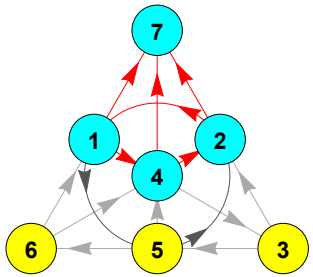
split=4

Fano plane



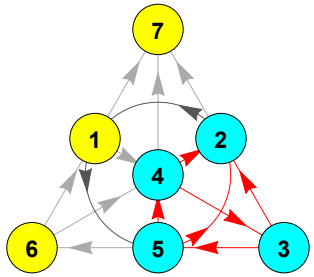
split=6

Fano plane



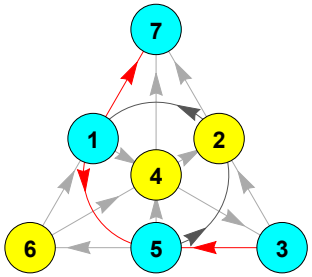
split=3

Fano plane



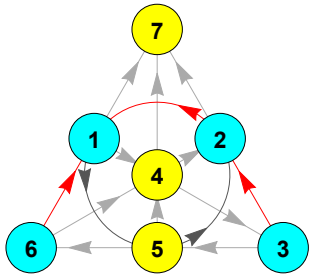
split=5

Fano plane



split=7

Fano plane

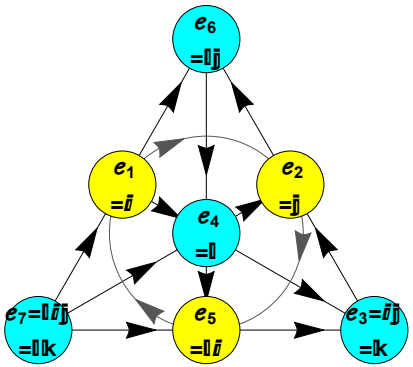


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
122	$d_{m_m}^{-1/3}$		0apggsscc 000011111_2	Bn{ 1 0 0 1 0 1 1 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Hf 72

flip=False

{1, 2, 5}{1, 4, 3}{1, 6, 7}{2, 6, 3}{2, 7, 4}{3, 7, 5}{4, 5, 6}

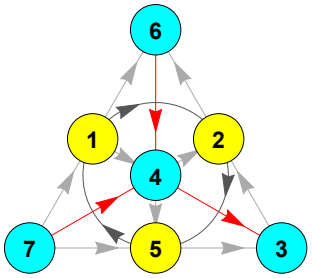
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	$-e_4$	e_3	$-e_2$	e_7	$-e_6$
e_2	$-e_5$	−1	$-e_6$	$-e_7$	e_1	e_3	e_4
e_3	e_4	e_6	−1	$-e_1$	$-e_7$	$-e_2$	e_5
e_4	$-e_3$	e_7	e_1	−1	e_6	$-e_5$	$-e_2$
e_5	e_2	$-e_1$	e_7	$-e_6$	−1	e_4	$-e_3$
e_6	$-e_7$	$-e_3$	e_2	e_5	$-e_4$	−1	e_1
e_7	e_6	$-e_4$	$-e_5$	e_2	e_3	$-e_1$	−1

split=1

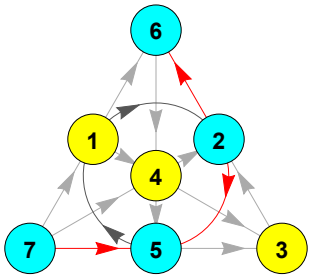
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−4	3	−2	7	−6
2	−5	−1	−6	−7	1	3	4
3	4	6	1	1	−7	2	−5
4	−3	7	−1	1	6	5	2
5	2	−1	7	−6	−1	4	−3
6	−7	−3	−2	−5	−4	1	−1
7	6	−4	5	−2	3	1	1

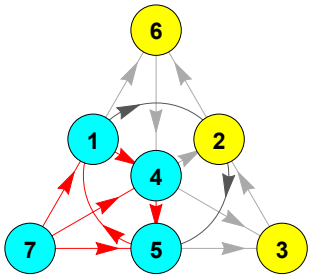
split=2

Fano plane



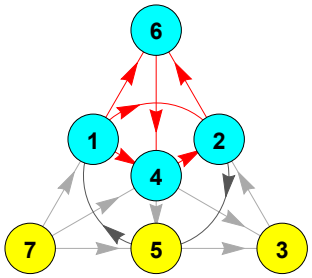
split=4

Fano plane



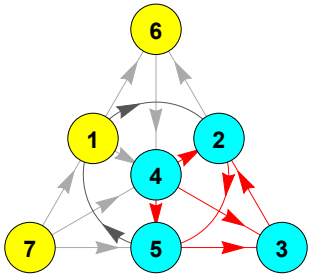
split=6

Fano plane



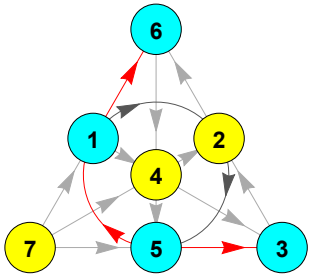
split=3

Fano plane



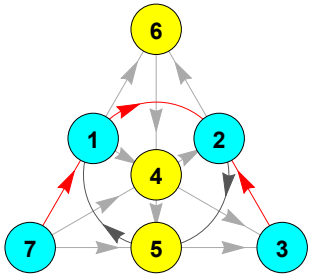
split=5

Fano plane



split=7

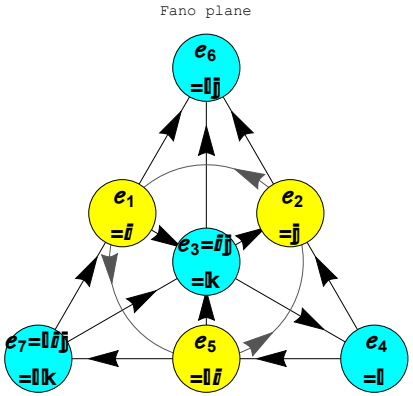
Fano plane



flip=True

{1, 5, 2}{1, 3, 4}{1, 6, 7}{2, 7, 3}{2, 6, 4}{3, 6, 5}{4, 5, 7}

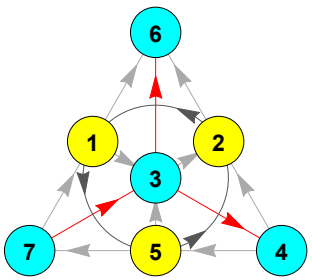
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_4	$-e_3$	e_2	e_7	$-e_6$
e_2	e_5	−1	$-e_7$	$-e_6$	$-e_1$	e_4	e_3
e_3	$-e_4$	e_7	−1	e_1	$-e_6$	e_5	$-e_2$
e_4	e_3	e_6	$-e_1$	−1	e_7	$-e_2$	$-e_5$
e_5	$-e_2$	e_1	e_6	$-e_7$	−1	$-e_3$	e_4
e_6	$-e_7$	$-e_4$	$-e_5$	e_2	e_3	−1	e_1
e_7	e_6	$-e_3$	e_2	e_5	$-e_4$	$-e_1$	−1

split=1

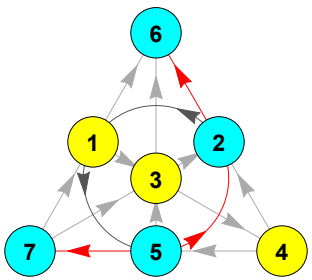
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	4	−3	2	7	−6
2	5	−1	−7	−6	−1	4	3
3	−4	7	1	−1	−6	−5	2
4	3	6	1	1	7	2	5
5	−2	1	6	−7	−1	−3	4
6	−7	−4	5	−2	3	1	−1
7	6	−3	−2	−5	−4	1	1

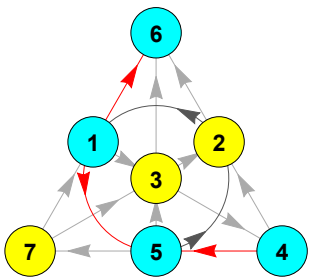
split=2

Fano plane



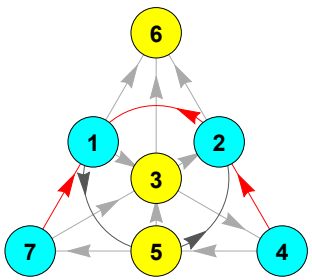
split=4

Fano plane



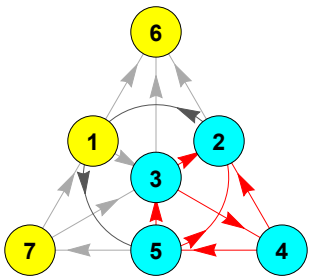
split=6

Fano plane



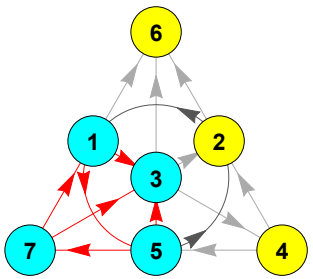
split=3

Fano plane



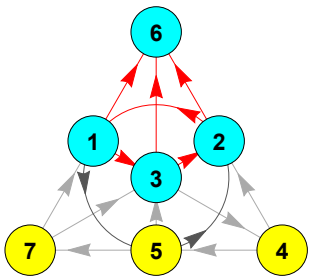
split=5

Fano plane



split=7

Fano plane

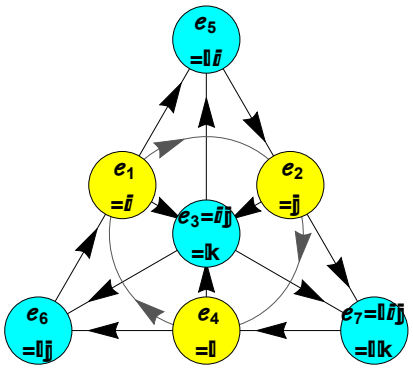


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
123	$d_{\substack{\to -1/3 \\ \mathbb{R}}}^{\to -1/3}$	■ ◆	0apggsscc	Bn{	1	0	0	1	0	1	0	1	}	$\overline{\overline{Os}}$
			0000111110_2	E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	}	76

flip=False

{1, 2, 4}{1, 3, 7}{1, 5, 6}{2, 3, 6}{2, 7, 5}{3, 5, 4}{4, 6, 7}

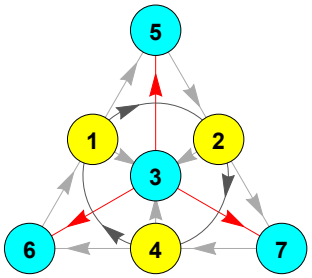
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	e_7	$-e_2$	e_6	$-e_5$	$-e_3$
e_2	e_2	$-e_4$	−1	e_6	e_1	$-e_7$	$-e_3$	e_5
e_3	e_3	$-e_7$	$-e_6$	−1	$-e_5$	e_4	e_2	e_1
e_4	e_4	e_2	$-e_1$	e_5	−1	$-e_3$	e_7	$-e_6$
e_5	e_5	$-e_6$	e_7	$-e_4$	e_3	−1	e_1	$-e_2$
e_6	e_6	e_5	e_3	$-e_2$	$-e_7$	$-e_1$	−1	e_4
e_7	e_7	e_3	$-e_5$	$-e_1$	e_6	e_2	$-e_4$	−1

split=1

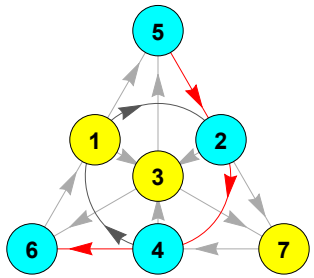
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	7	−2	6	−5	−3
2	−4	−1	6	1	−7	−3	5
3	−7	−6	1	−5	−4	−2	−1
4	2	−1	5	−1	−3	7	−6
5	−6	7	4	3	1	−1	2
6	5	3	2	−7	1	1	−4
7	3	−5	1	6	−2	4	1

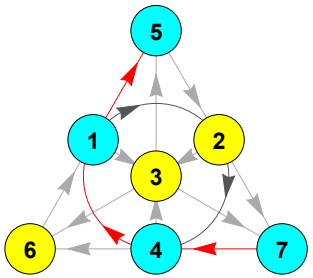
split=2

Fano plane



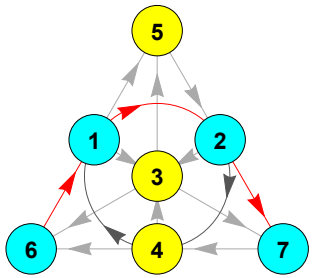
split=4

Fano plane



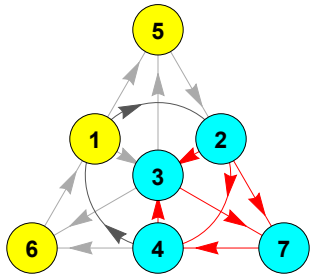
split=6

Fano plane



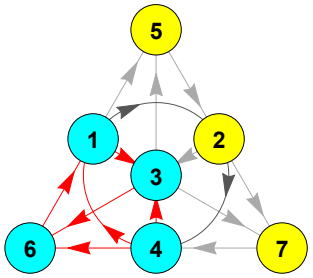
split=3

Fano plane



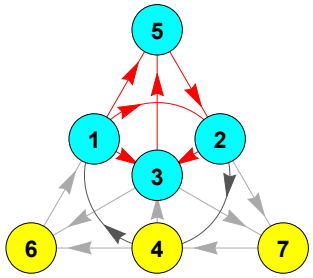
split=5

Fano plane



split=7

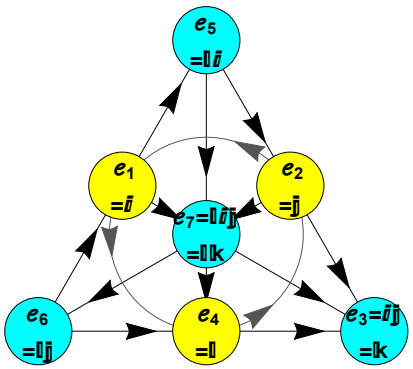
Fano plane



flip=True

{1, 4, 2}{1, 7, 3}{1, 5, 6}{2, 3, 5}{2, 7, 6}{3, 6, 4}{4, 5, 7}

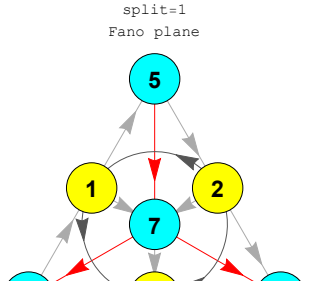
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	e_7	e_2	e_6	$-e_5$	e_3
e_2	e_2	$-e_4$	−1	e_5	$-e_1$	$-e_3$	$-e_7$	e_6
e_3	e_3	e_7	$-e_5$	−1	$-e_6$	e_2	e_4	$-e_1$
e_4	e_4	$-e_2$	e_1	e_6	−1	e_7	$-e_3$	$-e_5$
e_5	e_5	$-e_6$	e_3	$-e_2$	$-e_7$	−1	e_1	e_4
e_6	e_6	e_5	e_7	$-e_4$	e_3	$-e_1$	−1	$-e_2$
e_7	e_7	$-e_3$	$-e_6$	e_1	e_5	$-e_4$	e_2	−1

split=1

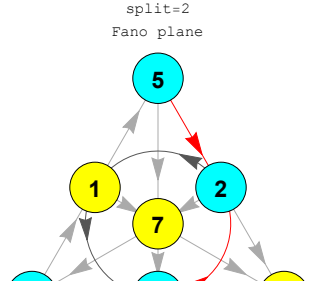
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−7	2	6	−5	3
2	4	−1	5	−1	−3	−7	6
3	7	−5	1	−6	−2	−4	1
4	−2	1	6	−1	7	−3	−5
5	−6	3	2	−7	1	−1	−4
6	5	7	4	3	1	1	2
7	−3	−6	−1	5	4	−2	1

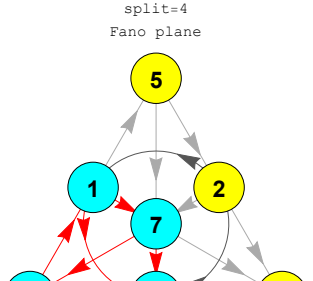
split=2

Fano plane



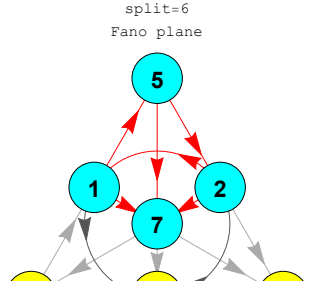
split=4

Fano plane



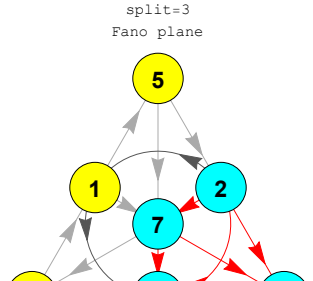
split=6

Fano plane



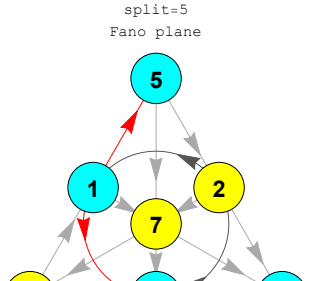
split=3

Fano plane



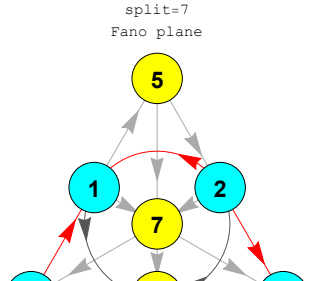
split=5

Fano plane



split=7

Fano plane

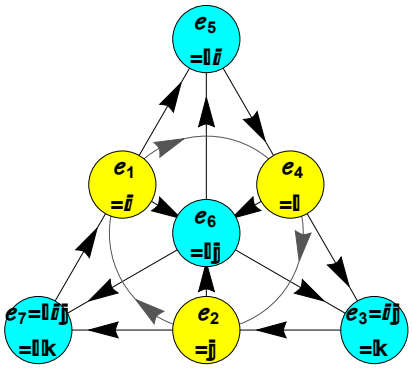


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
124	$d_{o_m}^{\vec{R}\to -1/3}$		0apggsscc 0000111101_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{Hg}$ 80

flip=False

{1, 4, 2}{1, 6, 3}{1, 5, 7}{2, 7, 3}{2, 6, 5}{3, 5, 4}{4, 6, 7}

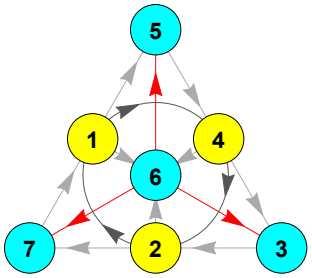
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	$-e_4$	$-e_6$	e_2	e_7	e_3	$-e_5$
e_2	e_2	e_4	-1	$-e_7$	$-e_1$	$-e_6$	e_5	e_3
e_3	e_3	e_6	e_7	-1	$-e_5$	e_4	$-e_1$	$-e_2$
e_4	e_4	$-e_2$	e_1	e_5	-1	$-e_3$	e_7	$-e_6$
e_5	e_5	$-e_7$	e_6	$-e_4$	e_3	-1	$-e_2$	e_1
e_6	e_6	$-e_3$	$-e_5$	e_1	$-e_7$	e_2	-1	e_4
e_7	e_7	e_5	$-e_3$	e_2	e_6	$-e_1$	$-e_4$	-1

split=1

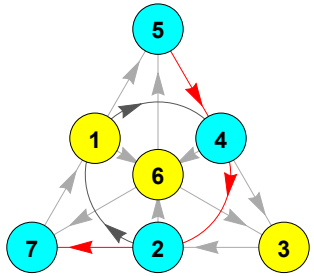
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	-6	2	7	3	-5
2	4	-1	-7	-1	-6	5	3
3	6	7	1	-5	-4	1	2
4	-2	1	5	-1	-3	7	-6
5	-7	6	4	3	1	2	-1
6	-3	-5	-1	-7	-2	1	-4
7	5	-3	-2	6	1	4	1

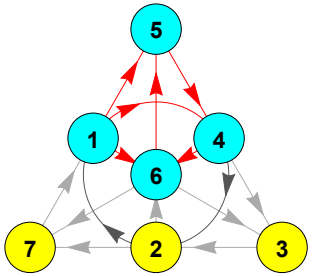
split=2

Fano plane



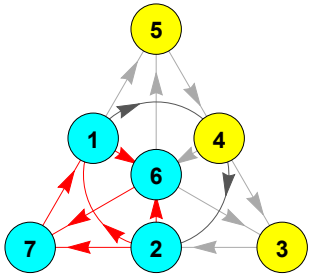
split=4

Fano plane



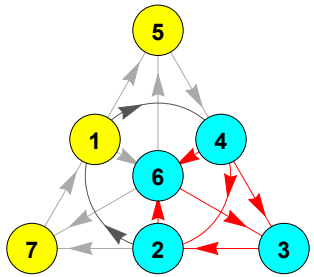
split=6

Fano plane



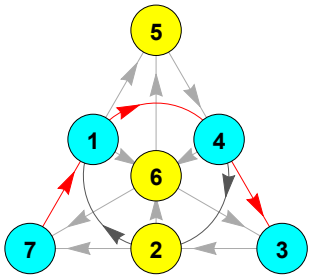
split=3

Fano plane



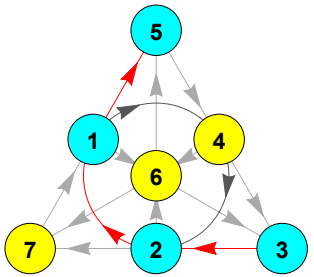
split=5

Fano plane



split=7

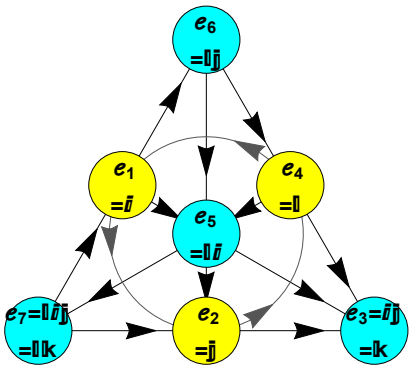
Fano plane



flip=True

{1, 2, 4}{1, 5, 3}{1, 6, 7}{2, 3, 7}{2, 6, 5}{3, 6, 4}{4, 5, 7}

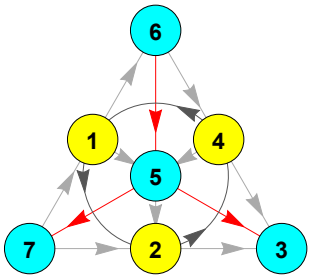
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_4	$-e_5$	$-e_2$	e_3	e_7	$-e_6$
e_2	e_2	$-e_4$	-1	e_7	e_1	$-e_6$	e_5	$-e_3$
e_3	e_3	e_5	$-e_7$	-1	$-e_6$	$-e_1$	e_4	e_2
e_4	e_4	e_2	$-e_1$	e_6	-1	e_7	$-e_3$	$-e_5$
e_5	e_5	$-e_3$	e_6	e_1	$-e_7$	-1	$-e_2$	e_4
e_6	e_6	$-e_7$	$-e_5$	$-e_4$	e_3	e_2	-1	e_1
e_7	e_7	e_6	e_3	$-e_2$	e_5	$-e_4$	$-e_1$	-1

split=1

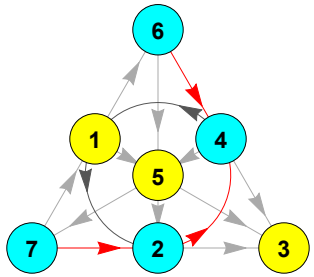
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	4	-5	-2	3	7	-6
2	-4	-1	7	1	-6	5	-3
3	5	-7	1	-6	1	-4	-2
4	2	-1	6	-1	7	-3	-5
5	-3	6	-1	-7	1	2	-4
6	-7	-5	4	3	-2	1	-1
7	6	3	2	5	4	1	1

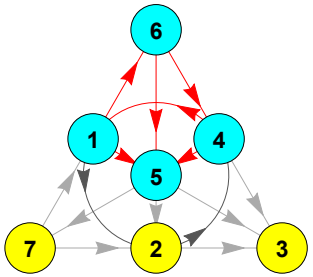
split=2

Fano plane



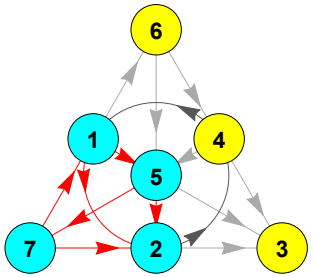
split=4

Fano plane



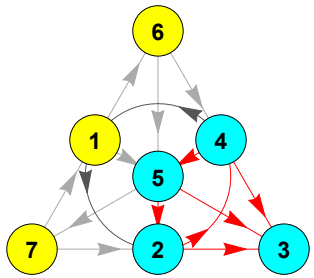
split=6

Fano plane



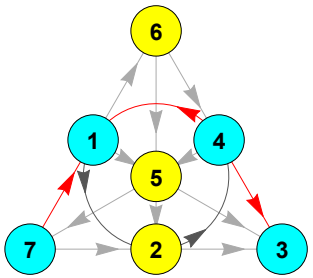
split=3

Fano plane



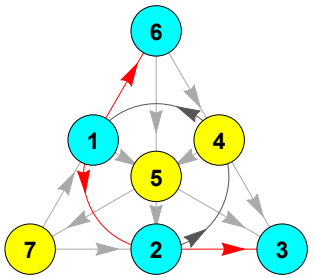
split=5

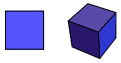
Fano plane



split=7

Fano plane

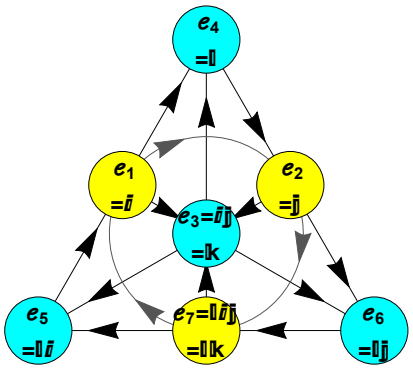


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
125	$t_{b_1}^{2/3}$		0apggsscc 001110111_2	Bn{ 1 0 0 0 1 1 1 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Dy 66

flip=False

{1, 2, 7}{1, 3, 6}{1, 4, 5}{2, 3, 5}{2, 6, 4}{3, 4, 7}{5, 6, 7}

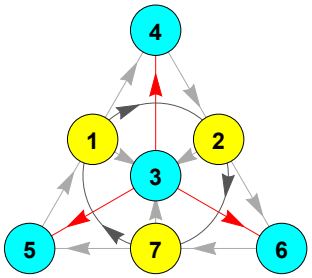
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_6	e_5	$-e_4$	$-e_3$	$-e_2$
e_2	$-e_7$	−1	e_5	$-e_6$	$-e_3$	e_4	e_1
e_3	$-e_6$	$-e_5$	−1	e_7	e_2	e_1	$-e_4$
e_4	$-e_5$	e_6	$-e_7$	−1	e_1	$-e_2$	e_3
e_5	e_4	e_3	$-e_2$	$-e_1$	−1	e_7	$-e_6$
e_6	e_3	$-e_4$	$-e_1$	e_2	$-e_7$	−1	e_5
e_7	e_2	$-e_1$	e_4	$-e_3$	e_6	$-e_5$	−1

split=1

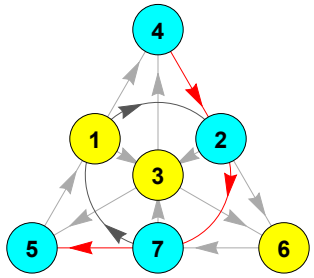
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	6	5	−4	−3	−2
2	−7	−1	5	−6	−3	4	1
3	−6	−5	1	−7	−2	−1	−4
4	−5	6	7	1	−1	2	3
5	4	3	2	1	1	−7	−6
6	3	−4	1	−2	7	1	5
7	2	−1	4	−3	6	−5	−1

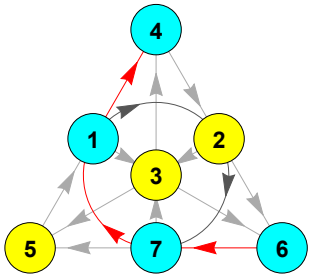
split=2

Fano plane



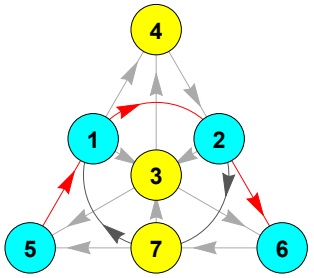
split=4

Fano plane



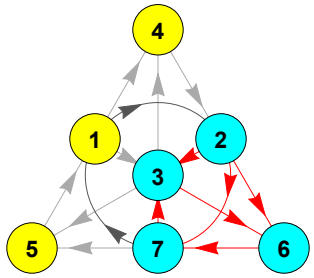
split=6

Fano plane



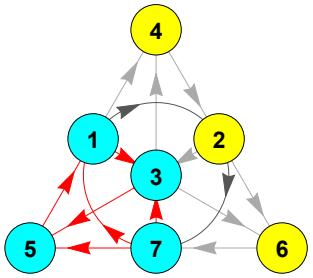
split=3

Fano plane



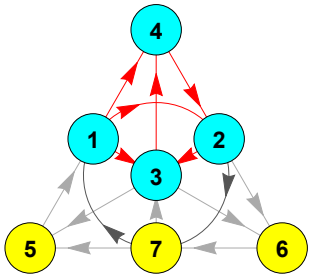
split=5

Fano plane



split=7

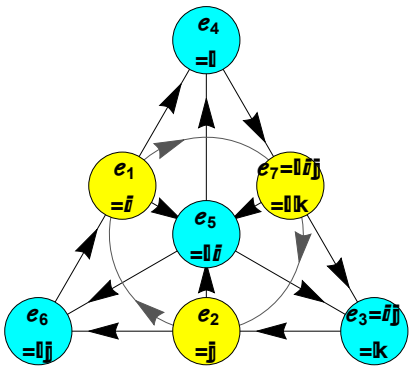
Fano plane



flip=True

{1, 7, 2}{1, 5, 3}{1, 4, 6}{2, 6, 3}{2, 5, 4}{3, 4, 7}{5, 6, 7}

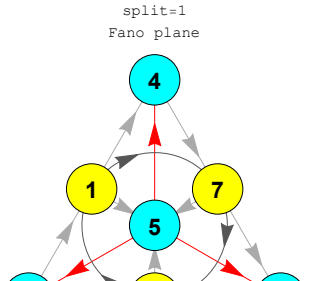
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_5$	e_6	e_3	$-e_4$	e_2
e_2	e_7	−1	$-e_6$	$-e_5$	e_4	e_3	$-e_1$
e_3	e_5	e_6	−1	e_7	$-e_1$	$-e_2$	$-e_4$
e_4	$-e_6$	e_5	$-e_7$	−1	$-e_2$	e_1	e_3
e_5	$-e_3$	$-e_4$	e_1	e_2	−1	e_7	$-e_6$
e_6	e_4	$-e_3$	e_2	$-e_1$	$-e_7$	−1	e_5
e_7	$-e_2$	e_1	e_4	$-e_3$	e_6	$-e_5$	−1

split=1

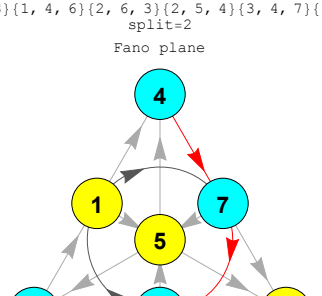
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−5	6	3	−4	2
2	7	−1	−6	−5	4	3	−1
3	5	6	1	−7	1	2	−4
4	−6	5	7	1	2	−1	3
5	−3	−4	−1	−2	1	−7	−6
6	4	−3	−2	1	7	1	5
7	−2	1	4	−3	6	−5	−1

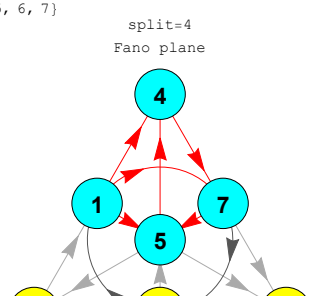
split=2

Fano plane



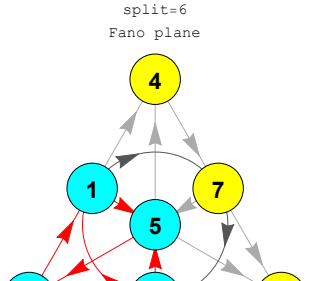
split=4

Fano plane



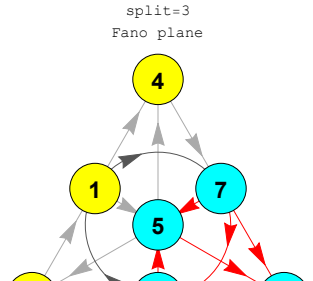
split=6

Fano plane



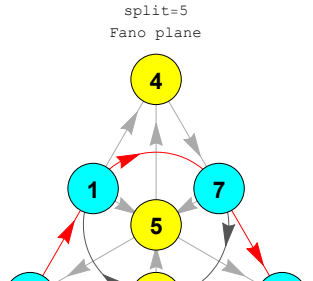
split=3

Fano plane



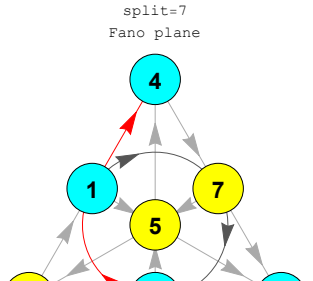
split=5

Fano plane



split=7

Fano plane

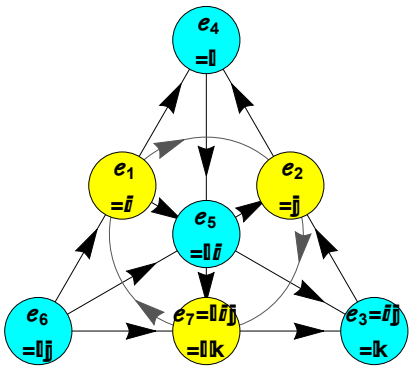


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
126	$t_{g_1}^{0\to 2/3}$		0apggsscc 001110110_2	Bn{ 1 0 0 0 1 1 0 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{Tl}}$ 81

flip=False

{1, 2, 7}{1, 5, 3}{1, 4, 6}{2, 4, 3}{2, 6, 5}{3, 6, 7}{4, 5, 7}

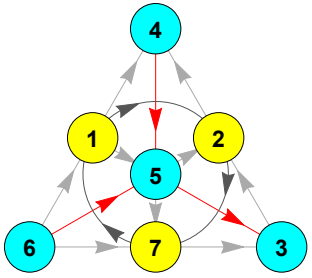
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	$-e_5$	e_6	e_3	$-e_4$	$-e_2$
e_2	e_2	$-e_7$	−1	$-e_4$	e_3	$-e_6$	e_5	e_1
e_3	e_3	e_5	e_4	−1	$-e_2$	$-e_1$	e_7	$-e_6$
e_4	e_4	$-e_6$	$-e_3$	e_2	−1	e_7	e_1	$-e_5$
e_5	e_5	$-e_3$	e_6	e_1	$-e_7$	−1	$-e_2$	e_4
e_6	e_6	e_4	$-e_5$	$-e_7$	$-e_1$	e_2	−1	e_3
e_7	e_7	e_2	$-e_1$	e_6	e_5	$-e_4$	$-e_3$	−1

split=1

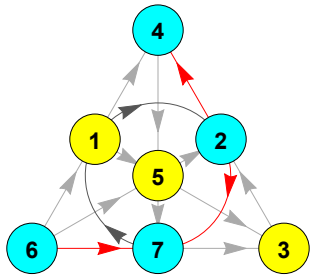
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−5	6	3	−4	−2
2	−7	−1	−4	3	−6	5	1
3	5	4	1	2	1	−7	−6
4	−6	−3	−2	1	−7	−1	−5
5	−3	6	−1	7	1	2	4
6	4	−5	7	1	−2	1	3
7	2	−1	6	5	−4	−3	−1

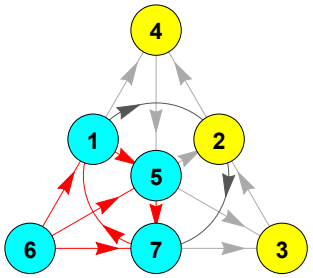
split=2

Fano plane



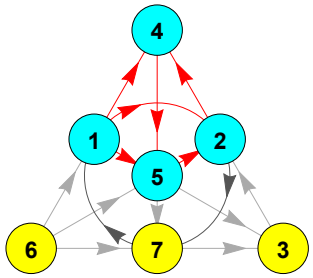
split=4

Fano plane



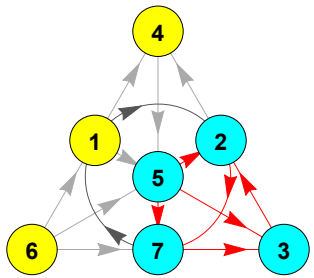
split=6

Fano plane



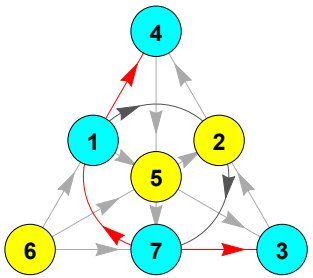
split=3

Fano plane



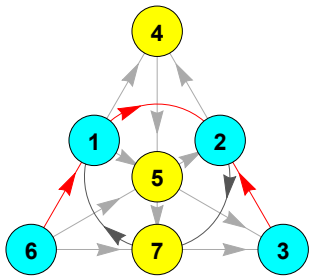
split=5

Fano plane



split=7

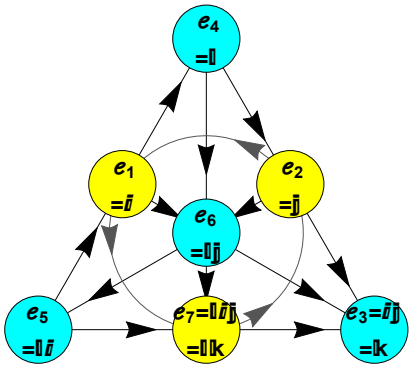
Fano plane



flip=True

{1, 7, 2}{1, 6, 3}{1, 4, 5}{2, 3, 4}{2, 6, 5}{3, 5, 7}{4, 6, 7}

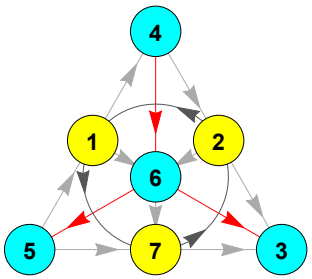
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	$-e_6$	e_5	$-e_4$	e_3	e_2
e_2	e_2	e_7	−1	e_4	$-e_3$	$-e_6$	e_5	$-e_1$
e_3	e_3	e_6	$-e_4$	−1	e_2	e_7	$-e_1$	$-e_5$
e_4	e_4	$-e_5$	e_3	$-e_2$	−1	e_1	e_7	$-e_6$
e_5	e_5	e_4	e_6	$-e_7$	$-e_1$	−1	$-e_2$	e_3
e_6	e_6	$-e_3$	$-e_5$	e_1	$-e_7$	e_2	−1	e_4
e_7	e_7	$-e_2$	e_1	e_5	e_6	$-e_3$	$-e_4$	−1

split=1

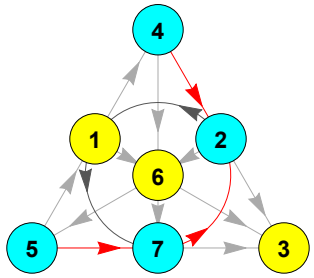
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−6	5	−4	3	2
2	7	−1	4	−3	−6	5	−1
3	6	−4	1	−2	−7	1	−5
4	−5	3	2	1	−1	−7	−6
5	4	6	7	1	1	2	3
6	−3	−5	−1	7	−2	1	4
7	−2	1	5	6	−3	−4	−1

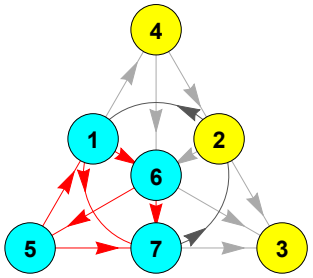
split=2

Fano plane



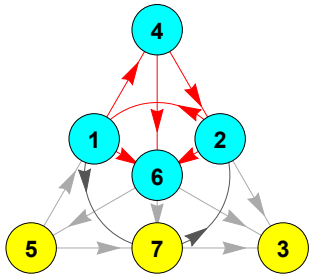
split=4

Fano plane



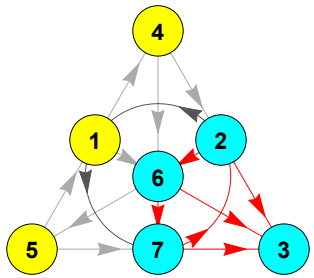
split=6

Fano plane



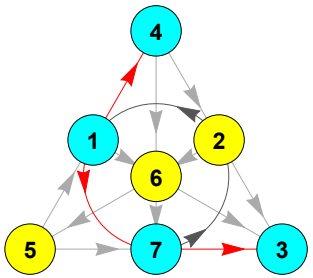
split=3

Fano plane



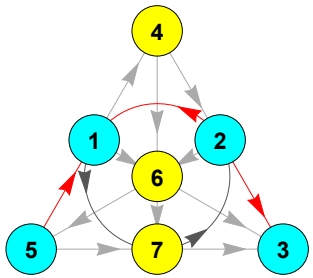
split=5

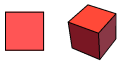
Fano plane



split=7

Fano plane

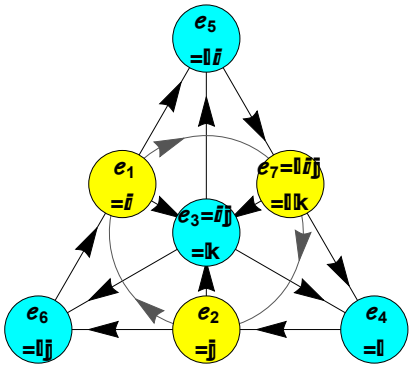


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
127	$t_{r_1}^{0\to 2/3}$		0apggsscc 001110101_2	Bn{ 1 0 0 0 1 0 1 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{At}}$ 85

flip=False

{1, 7, 2}{1, 3, 4}{1, 5, 6}{2, 3, 5}{2, 6, 4}{3, 6, 7}{4, 5, 7}

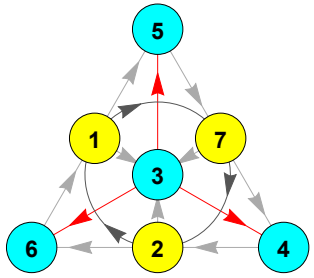
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_4	$-e_3$	e_6	$-e_5$	e_2
e_2	e_7	−1	e_5	$-e_6$	$-e_3$	e_4	$-e_1$
e_3	$-e_4$	$-e_5$	−1	e_1	e_2	e_7	$-e_6$
e_4	e_3	e_6	$-e_1$	−1	e_7	$-e_2$	$-e_5$
e_5	$-e_6$	e_3	$-e_2$	$-e_7$	−1	e_1	e_4
e_6	e_5	$-e_4$	$-e_7$	e_2	$-e_1$	−1	e_3
e_7	$-e_2$	e_1	e_6	e_5	$-e_4$	$-e_3$	−1

split=1

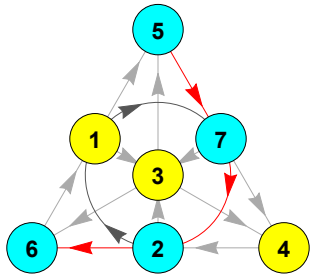
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	4	−3	6	−5	2
2	7	−1	5	−6	−3	4	−1
3	−4	−5	1	−1	−2	−7	−6
4	3	6	1	1	−7	2	−5
5	−6	3	2	7	1	−1	4
6	5	−4	7	−2	1	1	3
7	−2	1	6	5	−4	−3	−1

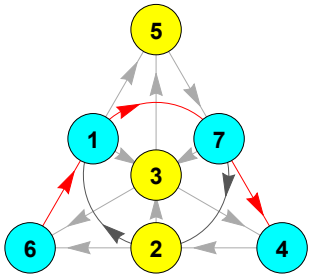
split=2

Fano plane



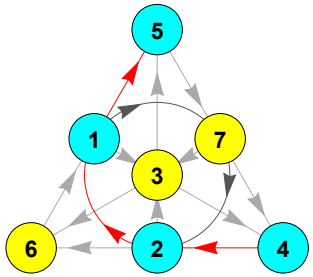
split=4

Fano plane



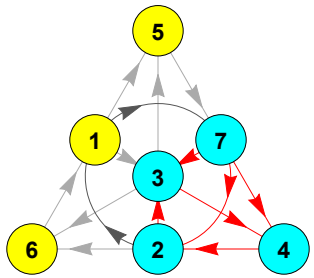
split=6

Fano plane



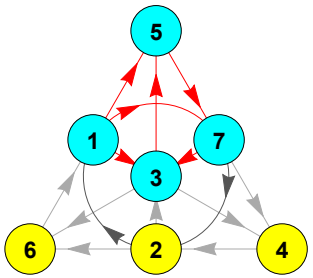
split=3

Fano plane



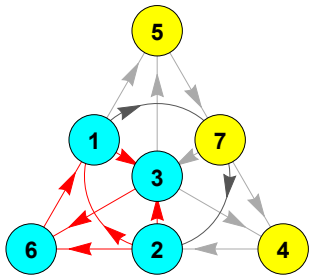
split=5

Fano plane



split=7

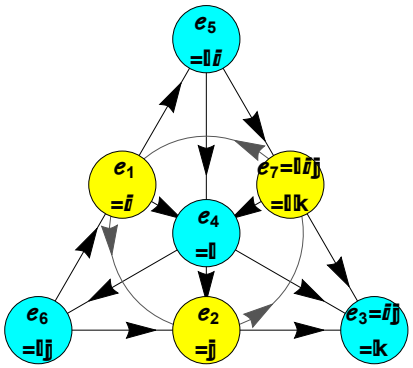
Fano plane



flip=True

{1, 2, 7}{1, 4, 3}{1, 5, 6}{2, 3, 6}{2, 5, 4}{3, 5, 7}{4, 6, 7}

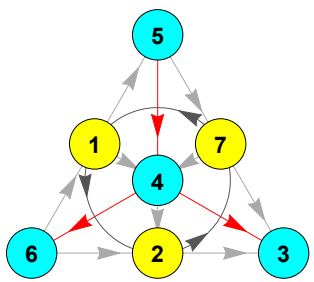
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_4$	e_3	e_6	$-e_5$	$-e_2$
e_2	$-e_7$	−1	e_6	$-e_5$	e_4	$-e_3$	e_1
e_3	e_4	$-e_6$	−1	$-e_1$	e_7	e_2	$-e_5$
e_4	$-e_3$	e_5	e_1	−1	$-e_2$	e_7	$-e_6$
e_5	$-e_6$	$-e_4$	$-e_7$	e_2	−1	e_1	e_3
e_6	e_5	e_3	$-e_2$	$-e_7$	$-e_1$	−1	e_4
e_7	e_2	$-e_1$	e_5	e_6	$-e_3$	$-e_4$	−1

split=1

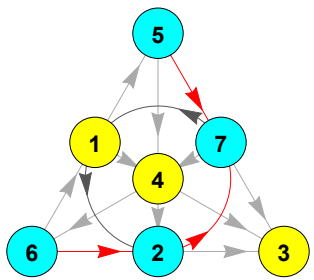
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−4	3	6	−5	−2
2	−7	−1	6	−5	4	−3	1
3	4	−6	1	1	−7	−2	−5
4	−3	5	−1	1	2	−7	−6
5	−6	−4	7	−2	1	−1	3
6	5	3	2	7	1	1	4
7	2	−1	5	6	−3	−4	−1

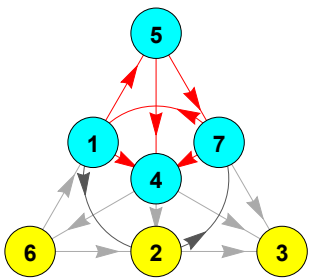
split=2

Fano plane



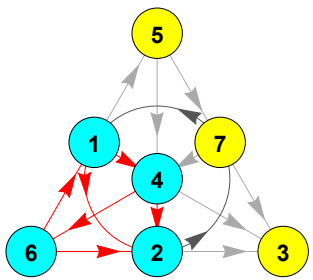
split=4

Fano plane



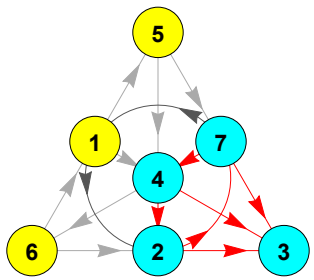
split=6

Fano plane



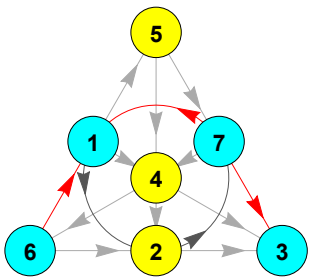
split=3

Fano plane



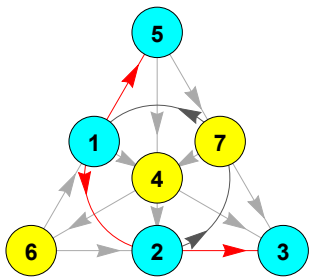
split=5

Fano plane



split=7

Fano plane

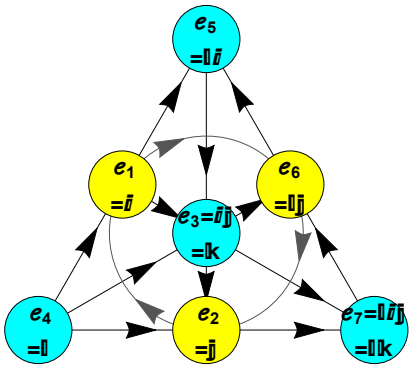


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
128	$\frac{\overline{t}}{y_d}\frac{+}{t}$		0apggsscc 010110000_2	Bn{ 1 0 0 0 0 1 1 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Ac}$ 89

flip=False

{1, 6, 2}{1, 3, 7}{1, 5, 4}{2, 5, 3}{2, 7, 4}{3, 6, 4}{5, 7, 6}

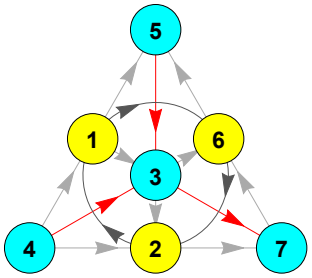
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	e_7	$-e_5$	e_4	e_2	$-e_3$
e_2	e_6	−1	$-e_5$	$-e_7$	e_3	$-e_1$	e_4
e_3	$-e_7$	e_5	−1	$-e_6$	$-e_2$	e_4	e_1
e_4	e_5	e_7	e_6	−1	$-e_1$	$-e_3$	$-e_2$
e_5	$-e_4$	$-e_3$	e_2	e_1	−1	$-e_7$	e_6
e_6	$-e_2$	e_1	$-e_4$	e_3	e_7	−1	$-e_5$
e_7	e_3	$-e_4$	$-e_1$	e_2	$-e_6$	e_5	−1

split=1

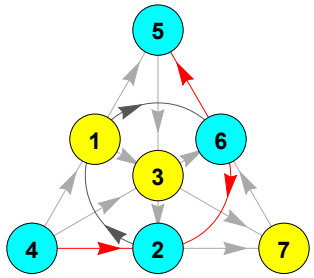
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	7	−5	4	2	−3
2	6	−1	−5	−7	3	−1	4
3	−7	5	1	6	2	4	−1
4	5	7	−6	1	1	−3	2
5	−4	−3	−2	−1	1	−7	−6
6	−2	1	−4	3	7	−1	−5
7	3	−4	1	−2	6	5	1

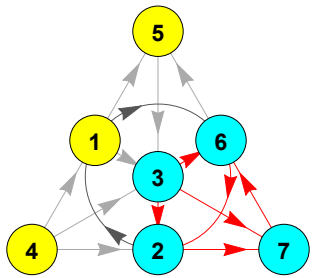
split=2

Fano plane



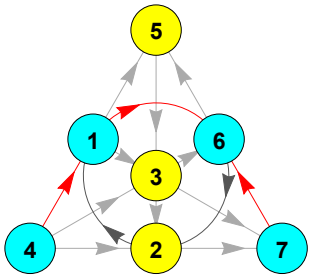
split=3

Fano plane



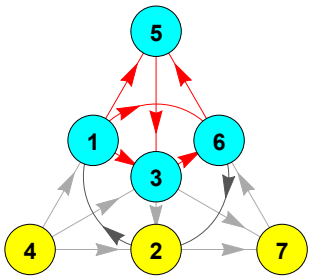
split=4

Fano plane



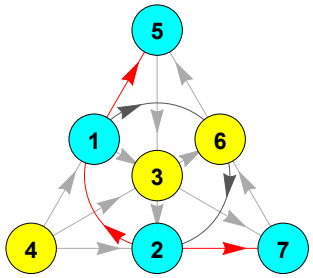
split=5

Fano plane



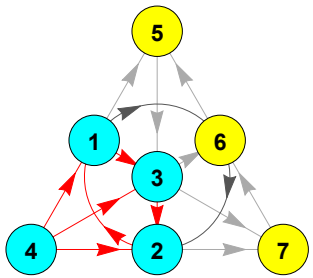
split=6

Fano plane



split=7

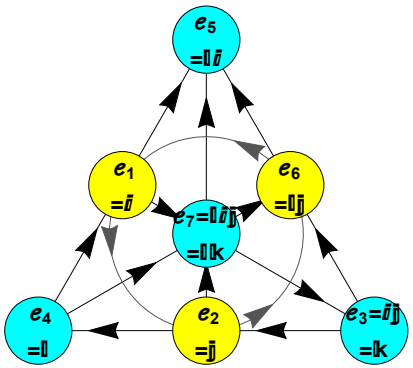
Fano plane



flip=True

{1, 2, 6}{1, 7, 3}{1, 5, 4}{2, 4, 3}{2, 7, 5}{3, 6, 5}{4, 7, 6}

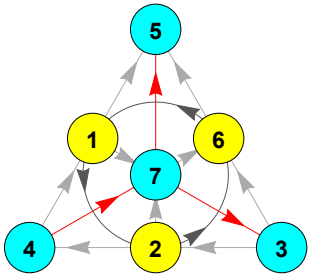
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_7$	$-e_5$	e_4	$-e_2$	e_3
e_2	$-e_6$	−1	$-e_4$	e_3	$-e_7$	e_1	e_5
e_3	e_7	e_4	−1	$-e_2$	$-e_6$	e_5	$-e_1$
e_4	e_5	$-e_3$	e_2	−1	$-e_1$	$-e_7$	e_6
e_5	$-e_4$	e_7	e_6	e_1	−1	$-e_3$	$-e_2$
e_6	e_2	$-e_1$	$-e_5$	e_7	e_3	−1	$-e_4$
e_7	$-e_3$	$-e_5$	e_1	$-e_6$	e_2	e_4	−1

split=1

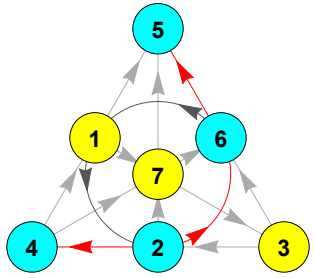
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−7	−5	4	−2	3
2	−6	−1	−4	3	−7	1	5
3	7	4	1	2	6	5	1
4	5	−3	−2	1	1	−7	−6
5	−4	7	−6	−1	1	−3	2
6	2	−1	−5	7	3	−1	−4
7	−3	−5	−1	6	−2	4	1

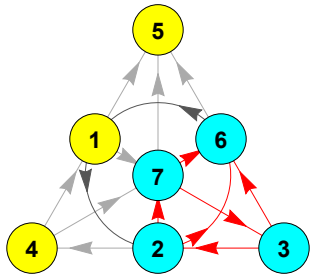
split=2

Fano plane



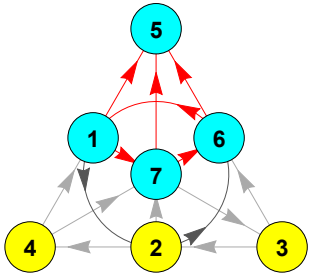
split=3

Fano plane



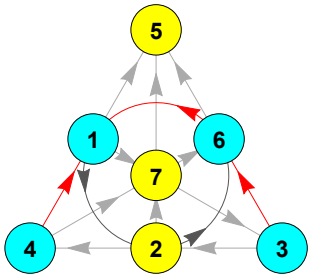
split=4

Fano plane



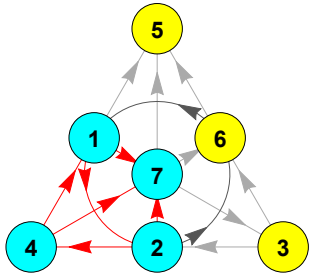
split=5

Fano plane



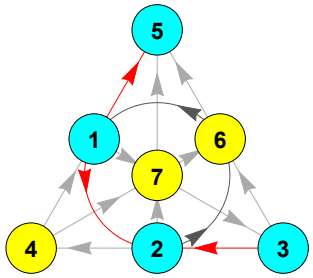
split=6

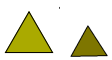
Fano plane



split=7

Fano plane

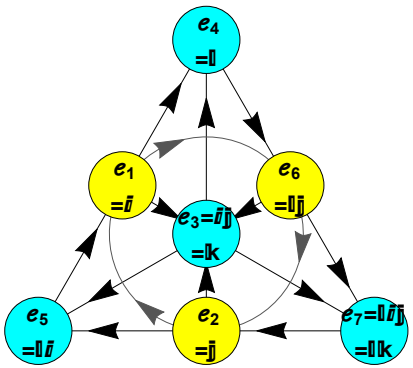


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
129	$\begin{smallmatrix}\tau\\ y_d\end{smallmatrix}\ \tilde{L}$		0apggsscc 000110000_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Ac 89

flip=False

{1, 6, 2}{1, 3, 7}{1, 4, 5}{2, 3, 4}{2, 5, 7}{3, 5, 6}{4, 6, 7}

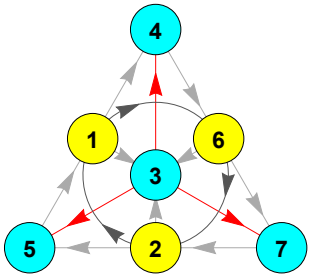
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_7	e_5	$-e_4$	e_2	$-e_3$
e_2	e_6	−1	e_4	$-e_3$	e_7	$-e_1$	$-e_5$	
e_3	e_7	$-e_4$	−1	e_2	e_6	$-e_5$	e_1	
e_4	$-e_5$	e_3	$-e_2$	−1	e_1	e_7	$-e_6$	
e_5	e_4	$-e_7$	$-e_6$	$-e_1$	−1	e_3	e_2	
e_6	$-e_2$	e_1	e_5	$-e_7$	$-e_3$	−1	e_4	
e_7	e_3	e_5	$-e_1$	e_6	$-e_2$	$-e_4$	−1	

split=1

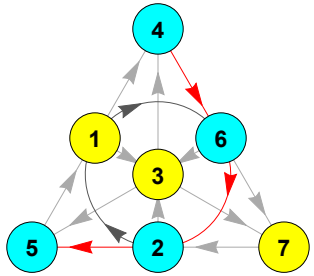
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	7	5	−4	2	−3
2	6	−1	4	−3	7	−1	−5
3	−7	−4	1	−2	−6	−5	−1
4	−5	3	2	1	−1	7	6
5	4	−7	6	1	1	3	−2
6	−2	1	5	−7	−3	−1	4
7	3	5	1	−6	2	−4	1

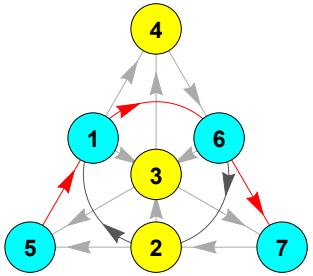
split=2

Fano plane



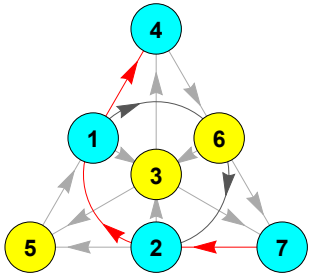
split=4

Fano plane



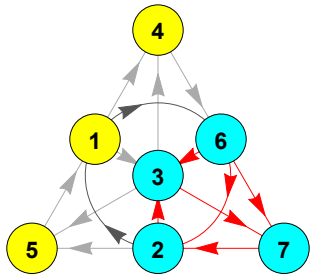
split=6

Fano plane



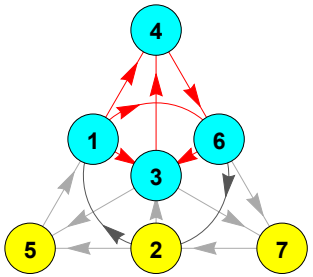
split=3

Fano plane



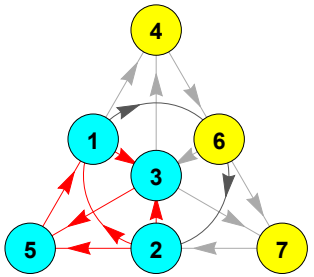
split=5

Fano plane



split=7

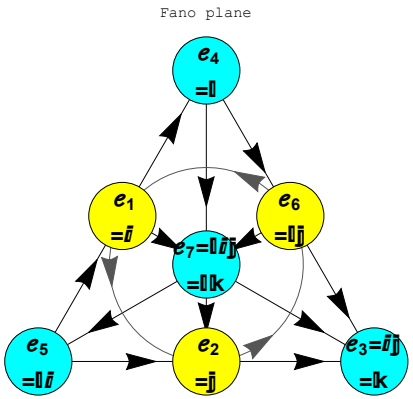
Fano plane



flip=True

{1, 2, 6}{1, 7, 3}{1, 4, 5}{2, 3, 5}{2, 4, 7}{3, 4, 6}{5, 6, 7}

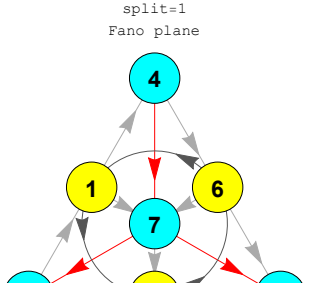
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	$-e_7$	e_5	$-e_4$	$-e_2$	e_3
e_2	$-e_6$	−1	e_5	e_7	$-e_3$	e_1	$-e_4$	
e_3	e_7	$-e_5$	−1	e_6	e_2	$-e_4$	$-e_1$	
e_4	$-e_5$	$-e_7$	$-e_6$	−1	e_1	e_3	e_2	
e_5	e_4	e_3	$-e_2$	$-e_1$	−1	e_7	$-e_6$	
e_6	e_2	$-e_1$	e_4	$-e_3$	$-e_7$	−1	e_5	
e_7	$-e_3$	e_4	e_1	$-e_2$	e_6	$-e_5$	−1	

split=1

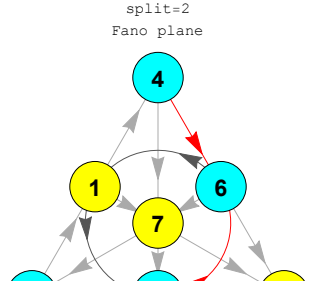
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−7	5	−4	−2	3
2	−6	−1	5	7	−3	1	−4
3	7	−5	1	−6	−2	−4	1
4	−5	−7	6	1	−1	3	−2
5	4	3	2	1	1	7	6
6	2	−1	4	−3	−7	−1	5
7	−3	4	−1	2	−6	−5	1

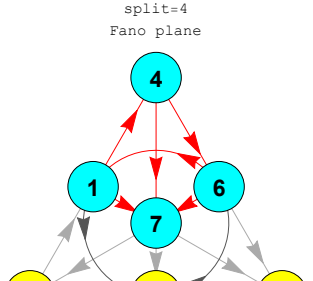
split=2

Fano plane



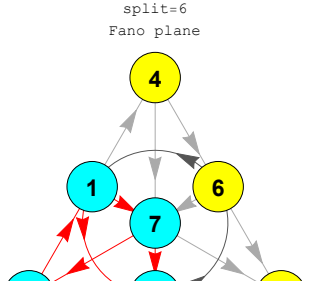
split=4

Fano plane



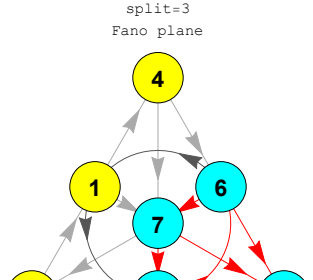
split=6

Fano plane



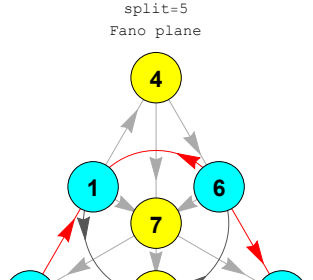
split=3

Fano plane



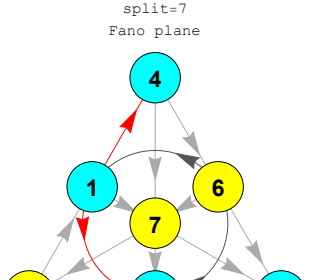
split=5

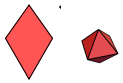
Fano plane



split=7

Fano plane

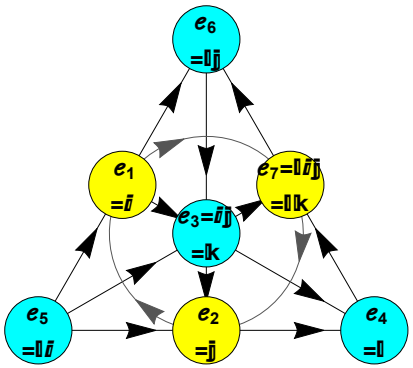


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits										Binary / E8 Coordinates	Ele #
130	$\overline{t}_{r_1}^{0\to -2/3}$		0apggsscc 0111101012	Bn{	0	1	1	1	0	1	0	0	}	At 85
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	}	

flip=False

{1, 7, 2}{1, 3, 4}{1, 6, 5}{2, 6, 3}{2, 4, 5}{3, 7, 5}{4, 7, 6}

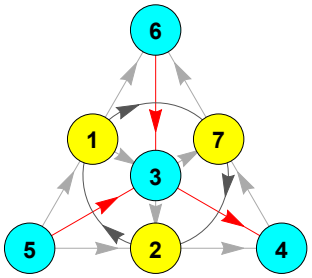
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_4	$-e_3$	$-e_6$	e_5	e_2
e_2	e_7	−1	$-e_6$	e_5	$-e_4$	e_3	$-e_1$
e_3	$-e_4$	e_6	−1	e_1	$-e_7$	$-e_2$	e_5
e_4	e_3	$-e_5$	$-e_1$	−1	e_2	$-e_7$	e_6
e_5	e_6	e_4	e_7	$-e_2$	−1	$-e_1$	$-e_3$
e_6	$-e_5$	$-e_3$	e_2	e_7	e_1	−1	$-e_4$
e_7	$-e_2$	e_1	$-e_5$	$-e_6$	e_3	e_4	−1

split=1

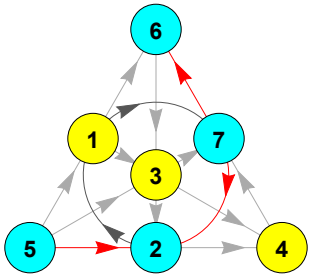
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	4	−3	−6	5	2
2	7	−1	−6	5	−4	3	−1
3	−4	6	1	−1	7	2	5
4	3	−5	1	1	−2	7	6
5	6	4	−7	2	1	1	−3
6	−5	−3	−2	−7	−1	1	−4
7	−2	1	−5	−6	3	4	−1

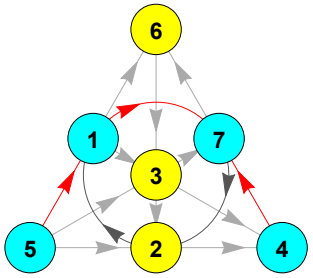
split=2

Fano plane



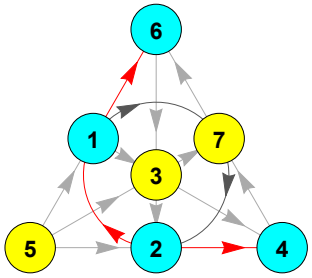
split=4

Fano plane



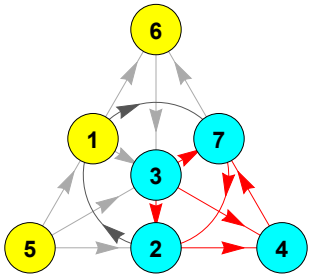
split=6

Fano plane



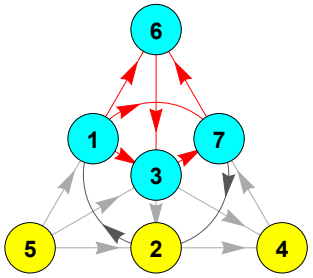
split=3

Fano plane



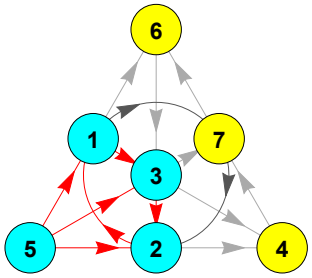
split=5

Fano plane



split=7

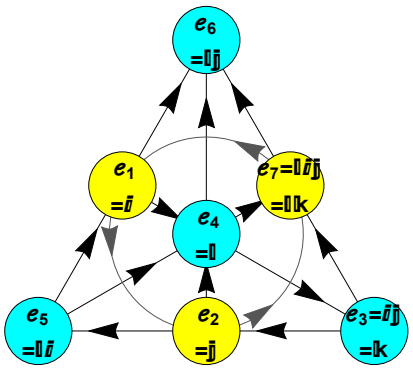
Fano plane



flip=True

{1, 2, 7}{1, 4, 3}{1, 6, 5}{2, 5, 3}{2, 4, 6}{3, 7, 6}{4, 7, 5}

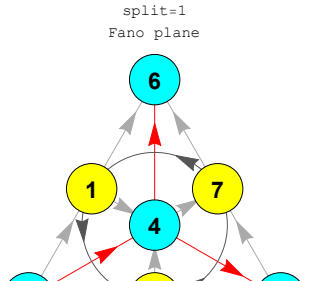
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_4$	e_3	$-e_6$	e_5	$-e_2$
e_2	$-e_7$	−1	$-e_5$	e_6	e_3	$-e_4$	e_1
e_3	e_4	e_5	−1	$-e_1$	$-e_2$	$-e_7$	e_6
e_4	$-e_3$	$-e_6$	e_1	−1	$-e_7$	e_2	e_5
e_5	e_6	$-e_3$	e_2	e_7	−1	$-e_1$	$-e_4$
e_6	$-e_5$	e_4	e_7	$-e_2$	e_1	−1	$-e_3$
e_7	e_2	$-e_1$	$-e_6$	$-e_5$	e_4	e_3	−1

split=1

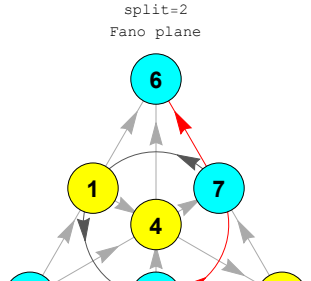
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−4	3	−6	5	−2
2	−7	−1	−5	6	3	−4	1
3	4	5	1	1	2	7	6
4	−3	−6	−1	1	7	−2	5
5	6	−3	−2	−7	1	1	−4
6	−5	4	−7	2	−1	1	−3
7	2	−1	−6	−5	4	3	−1

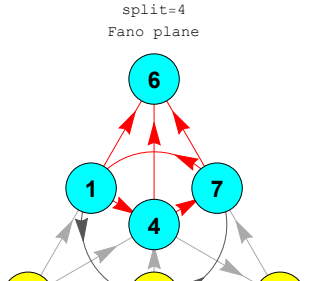
split=2

Fano plane



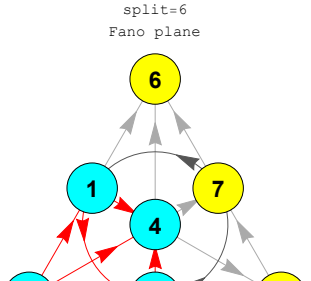
split=4

Fano plane



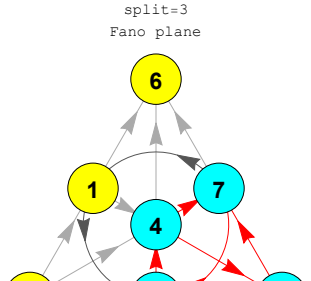
split=6

Fano plane



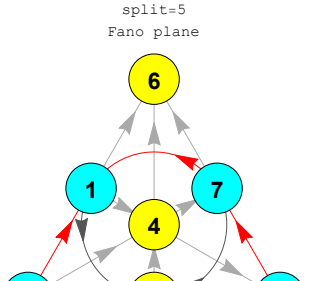
split=3

Fano plane



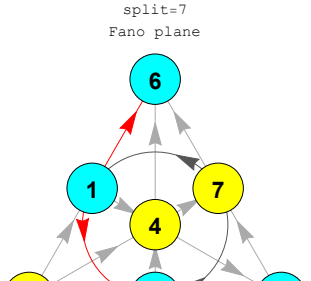
split=5

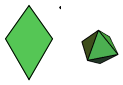
Fano plane



split=7

Fano plane

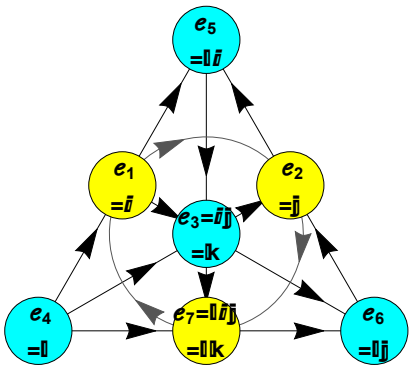


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
131	$\overline{t}_{g_1}^{0\to -2/3}$		0apggsscc 0111101102	Bn{ 0 1 1 1 0 0 1 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	T1 81

flip=False

{1, 2, 7}{1, 3, 6}{1, 5, 4}{2, 4, 3}{2, 5, 6}{3, 7, 5}{4, 7, 6}

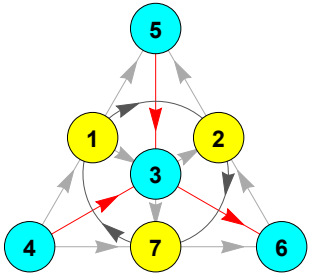
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	e_6	$-e_5$	e_4	$-e_3$	$-e_2$
e_2	e_2	$-e_7$	−1	$-e_4$	e_3	e_6	$-e_5$	e_1
e_3	e_3	$-e_6$	e_4	−1	$-e_2$	e_7	e_1	e_5
e_4	e_4	e_5	$-e_3$	e_2	−1	$-e_1$	$-e_7$	e_6
e_5	e_5	$-e_4$	$-e_6$	e_7	e_1	−1	e_2	$-e_3$
e_6	e_6	e_3	e_5	$-e_1$	e_7	$-e_2$	−1	$-e_4$
e_7	e_7	e_2	$-e_1$	$-e_5$	$-e_6$	e_3	e_4	−1

split=1

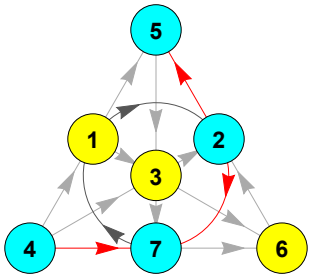
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	6	−5	4	−3	−2
2	−7	−1	−4	3	6	−5	1
3	−6	4	1	2	7	−1	5
4	5	−3	−2	1	1	7	6
5	−4	−6	−7	−1	1	−2	−3
6	3	5	1	−7	2	1	−4
7	2	−1	−5	−6	3	4	−1

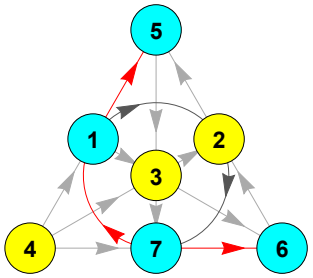
split=2

Fano plane



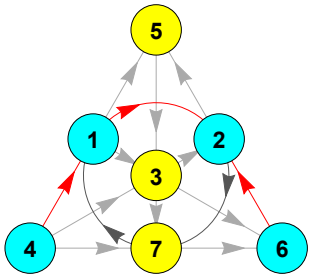
split=4

Fano plane



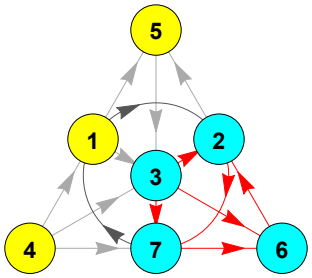
split=6

Fano plane



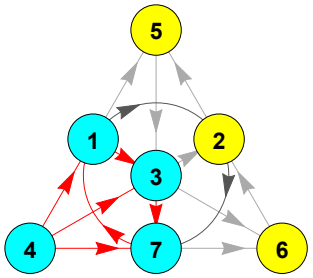
split=3

Fano plane



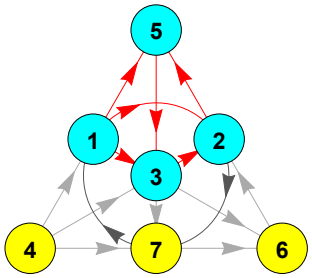
split=5

Fano plane



split=7

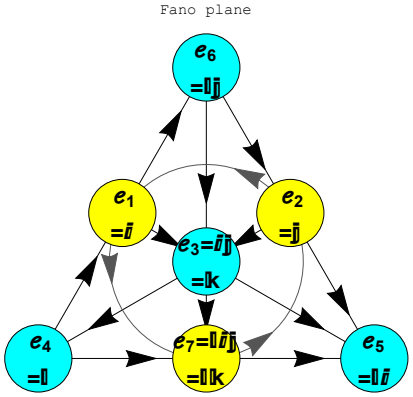
Fano plane



flip=True

{1, 7, 2}{1, 3, 5}{1, 6, 4}{2, 3, 4}{2, 5, 6}{3, 7, 6}{4, 7, 5}

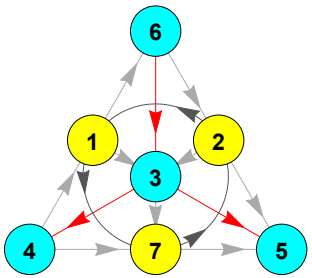
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	e_5	$-e_6$	$-e_3$	e_4	e_2
e_2	e_2	e_7	−1	e_4	$-e_3$	e_6	$-e_5$	$-e_1$
e_3	e_3	$-e_5$	$-e_4$	−1	e_2	e_1	$-e_7$	e_6
e_4	e_4	e_6	e_3	$-e_2$	−1	$-e_7$	$-e_1$	e_5
e_5	e_5	e_3	$-e_6$	$-e_1$	e_7	−1	e_2	$-e_4$
e_6	e_6	$-e_4$	e_5	e_7	e_1	$-e_2$	−1	$-e_3$
e_7	e_7	$-e_2$	e_1	$-e_6$	$-e_5$	e_4	e_3	−1

split=1

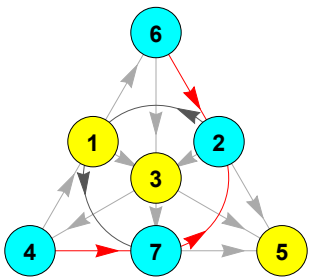
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	5	−6	−3	4	2
2	7	−1	4	−3	6	−5	−1
3	−5	−4	1	−2	−1	7	6
4	6	3	2	1	7	1	5
5	3	−6	1	−7	1	−2	−4
6	−4	5	−7	−1	2	1	−3
7	−2	1	−6	−5	4	3	−1

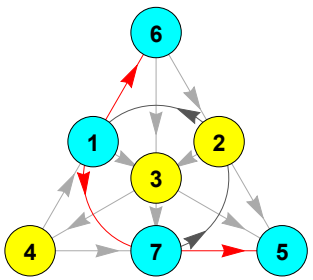
split=2

Fano plane



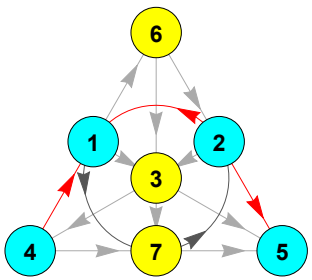
split=4

Fano plane



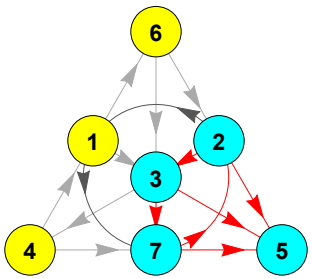
split=6

Fano plane



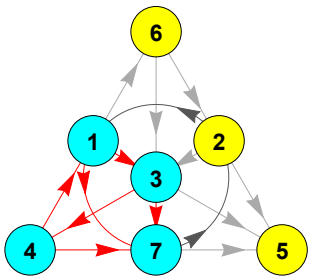
split=3

Fano plane



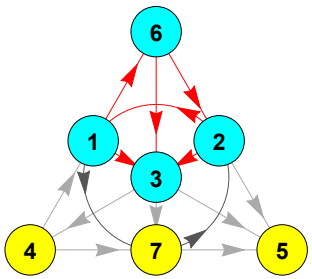
split=5

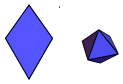
Fano plane



split=7

Fano plane

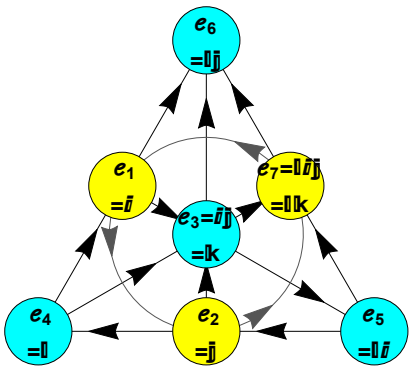


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
132	$\overline{t}_{b_1}{}^{\hat{R}^{2/3}}$		0apggsscc 011110111_2	Bn{ 0 1 1 1 0 0 0 1 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Dy}$ 66

flip=False

{1, 2, 7}{1, 3, 5}{1, 6, 4}{2, 3, 6}{2, 4, 5}{3, 7, 4}{5, 7, 6}

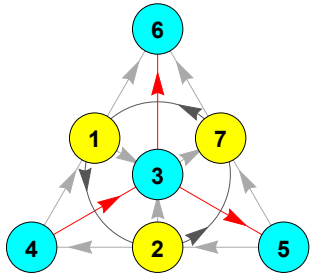
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_5	$-e_6$	$-e_3$	e_4	$-e_2$
e_2	$-e_7$	−1	e_6	e_5	$-e_4$	$-e_3$	e_1
e_3	$-e_5$	$-e_6$	−1	$-e_7$	e_1	e_2	e_4
e_4	e_6	$-e_5$	e_7	−1	e_2	$-e_1$	$-e_3$
e_5	e_3	e_4	$-e_1$	$-e_2$	−1	$-e_7$	e_6
e_6	$-e_4$	e_3	$-e_2$	e_1	e_7	−1	$-e_5$
e_7	e_2	$-e_1$	$-e_4$	e_3	$-e_6$	e_5	−1

split=1

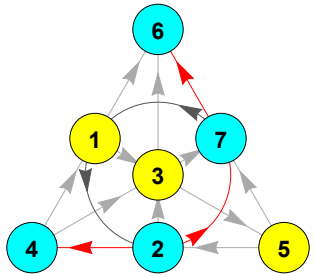
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	5	−6	−3	4	−2
2	−7	−1	6	5	−4	−3	1
3	−5	−6	1	7	−1	−2	4
4	6	−5	−7	1	−2	1	−3
5	3	4	1	2	1	7	6
6	−4	3	2	−1	−7	1	−5
7	2	−1	−4	3	−6	5	−1

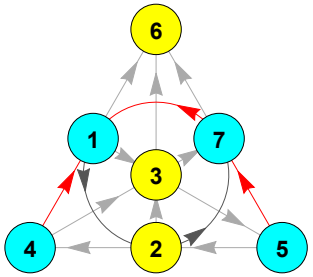
split=2

Fano plane



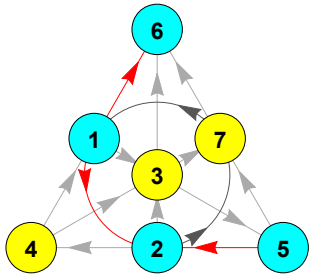
split=4

Fano plane



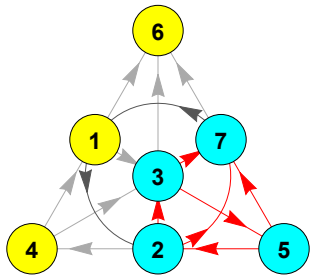
split=6

Fano plane



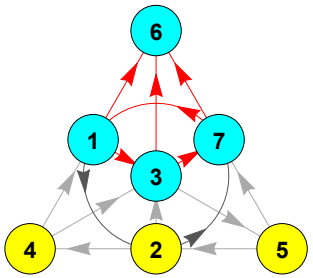
split=3

Fano plane



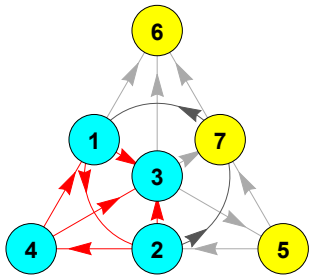
split=5

Fano plane



split=7

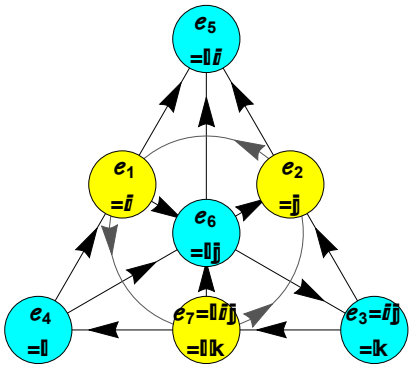
Fano plane



flip=True

{1, 7, 2}{1, 6, 3}{1, 5, 4}{2, 5, 3}{2, 4, 6}{3, 7, 4}{5, 7, 6}

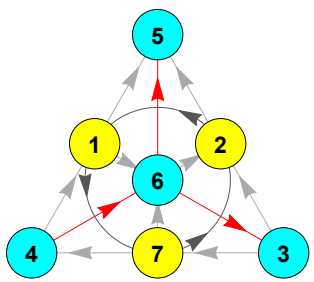
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_6$	$-e_5$	e_4	e_3	e_2
e_2	e_7	−1	$-e_5$	e_6	e_3	$-e_4$	$-e_1$
e_3	e_6	e_5	−1	$-e_7$	$-e_2$	$-e_1$	e_4
e_4	e_5	$-e_6$	e_7	−1	$-e_1$	e_2	$-e_3$
e_5	$-e_4$	$-e_3$	e_2	e_1	−1	$-e_7$	e_6
e_6	$-e_3$	e_4	e_1	$-e_2$	e_7	−1	$-e_5$
e_7	$-e_2$	e_1	$-e_4$	e_3	$-e_6$	e_5	−1

split=1

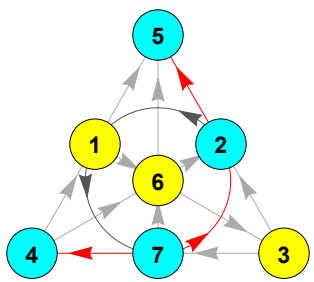
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−6	−5	4	3	2
2	7	−1	−5	6	3	−4	−1
3	6	5	1	7	2	1	4
4	5	−6	−7	1	1	−2	−3
5	−4	−3	−2	−1	1	7	6
6	−3	4	−1	2	−7	1	−5
7	−2	1	−4	3	−6	5	−1

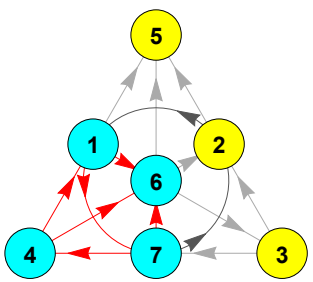
split=2

Fano plane



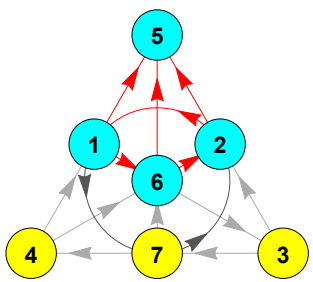
split=4

Fano plane



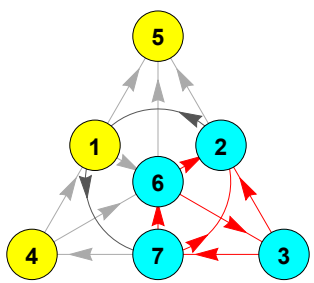
split=6

Fano plane



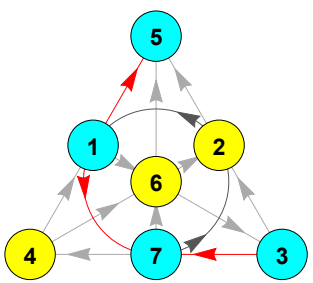
split=3

Fano plane



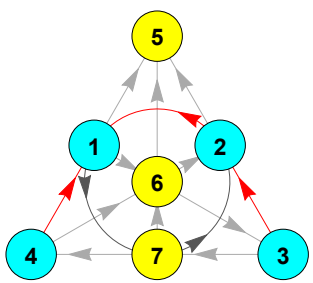
split=5

Fano plane



split=7

Fano plane

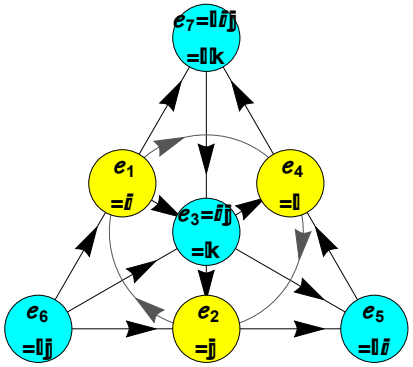


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
133	$\overline{\underset{\text{Om}}{\text{d}}}^{\text{R}^{\mapsto 1/3}}$		0apggsscc 0100111101_2	Bn{ 0 1 1 0 1 1 0 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Hg 80

flip=False

{1, 4, 2}{1, 3, 5}{1, 7, 6}{2, 7, 3}{2, 5, 6}{3, 4, 6}{4, 7, 5}

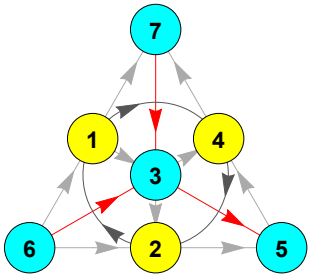
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_5	e_2	$-e_3$	$-e_7$	e_6
e_2	e_4	−1	$-e_7$	$-e_1$	e_6	$-e_5$	e_3
e_3	$-e_5$	e_7	−1	e_6	e_1	$-e_4$	$-e_2$
e_4	$-e_2$	e_1	$-e_6$	−1	$-e_7$	e_3	e_5
e_5	e_3	$-e_6$	$-e_1$	e_7	−1	e_2	$-e_4$
e_6	e_7	e_5	e_4	$-e_3$	$-e_2$	−1	$-e_1$
e_7	$-e_6$	$-e_3$	e_2	$-e_5$	e_4	e_1	−1

split=1

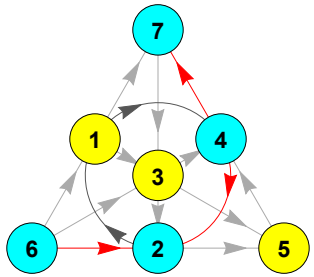
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	5	2	−3	−7	6
2	4	−1	−7	−1	6	−5	3
3	−5	7	1	6	−1	4	2
4	−2	1	−6	−1	−7	3	5
5	3	−6	1	7	1	−2	4
6	7	5	−4	−3	2	1	1
7	−6	−3	−2	−5	−4	−1	1

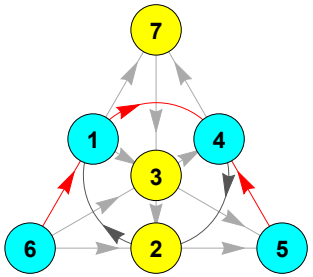
split=2

Fano plane



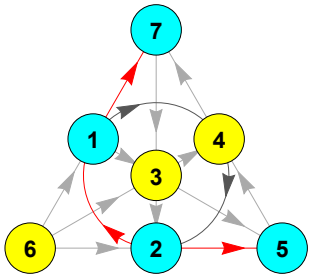
split=4

Fano plane



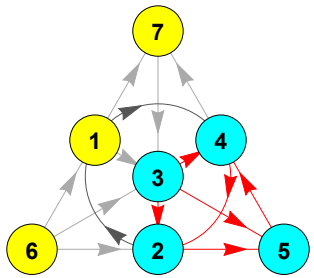
split=6

Fano plane



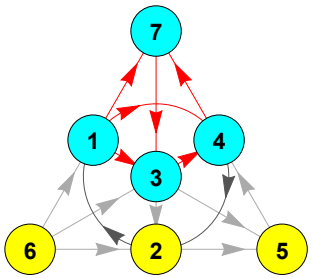
split=3

Fano plane



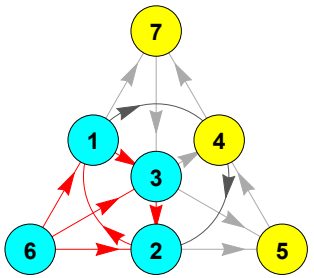
split=5

Fano plane



split=7

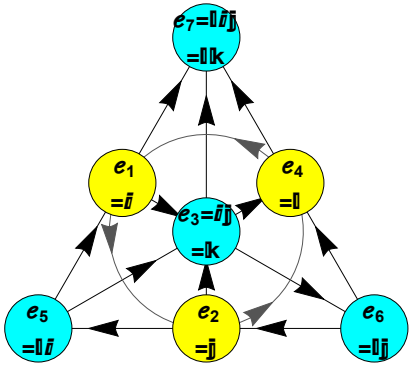
Fano plane



flip=True

{1, 2, 4}{1, 3, 6}{1, 7, 5}{2, 3, 7}{2, 5, 6}{3, 4, 5}{4, 7, 6}

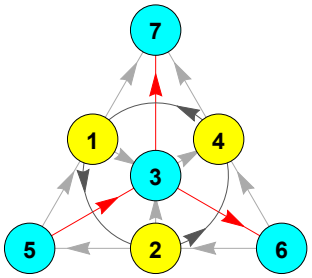
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_6	$-e_2$	$-e_7$	$-e_3$	e_5
e_2	$-e_4$	−1	e_7	e_1	e_6	$-e_5$	$-e_3$
e_3	$-e_6$	$-e_7$	−1	e_5	$-e_4$	e_1	e_2
e_4	e_2	$-e_1$	$-e_5$	−1	e_3	$-e_7$	e_6
e_5	e_7	$-e_6$	e_4	$-e_3$	−1	e_2	$-e_1$
e_6	e_3	e_5	$-e_1$	e_7	$-e_2$	−1	$-e_4$
e_7	$-e_5$	e_3	$-e_2$	$-e_6$	e_1	e_4	−1

split=1

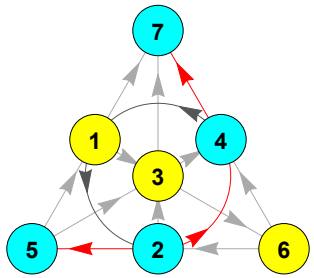
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	6	−2	−7	−3	5
2	−4	−1	7	1	6	−5	−3
3	−6	−7	1	5	4	−1	−2
4	2	−1	−5	−1	3	−7	6
5	7	−6	−4	−3	1	−2	1
6	3	5	1	7	2	1	4
7	−5	3	2	−6	−1	−4	1

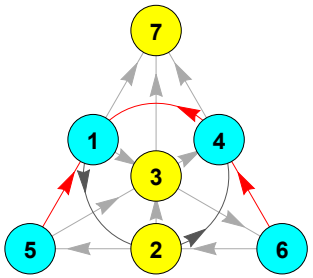
split=2

Fano plane



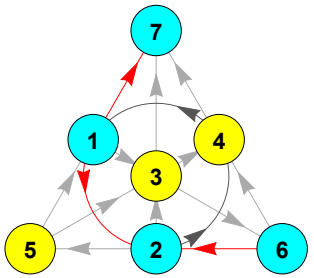
split=4

Fano plane



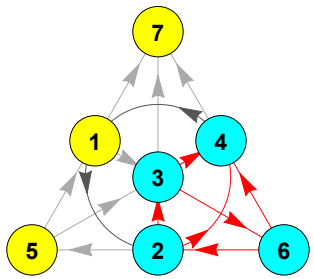
split=6

Fano plane



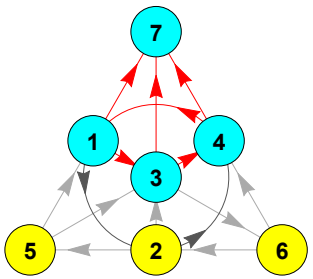
split=3

Fano plane



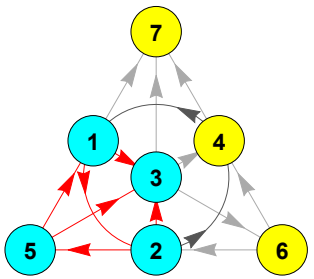
split=5

Fano plane



split=7

Fano plane

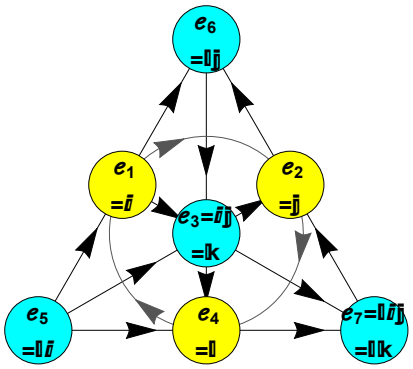


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
134	$\overline{\underset{c_m}{d}}^{\overset{\mapsto 1/3}{R}}$		0apggsscc 010011110_2	Bn{ 0 1 1 0 1 0 1 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Os 76

flip=False

{1, 2, 4}{1, 3, 7}{1, 6, 5}{2, 5, 3}{2, 6, 7}{3, 4, 6}{4, 7, 5}

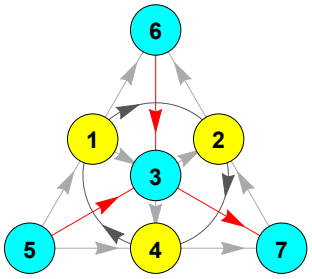
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_7	$-e_2$	$-e_6$	e_5	$-e_3$
e_2	$-e_4$	−1	$-e_5$	e_1	e_3	e_7	$-e_6$
e_3	$-e_7$	e_5	−1	e_6	$-e_2$	$-e_4$	e_1
e_4	e_2	$-e_1$	$-e_6$	−1	$-e_7$	e_3	e_5
e_5	e_6	$-e_3$	e_2	e_7	−1	$-e_1$	$-e_4$
e_6	$-e_5$	$-e_7$	e_4	$-e_3$	e_1	−1	e_2
e_7	e_3	e_6	$-e_1$	$-e_5$	e_4	$-e_2$	−1

split=1

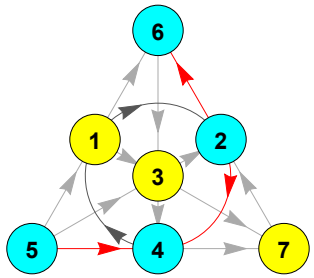
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	7	−2	−6	5	−3
2	−4	−1	−5	1	3	7	−6
3	−7	5	1	6	2	4	−1
4	2	−1	−6	−1	−7	3	5
5	6	−3	−2	7	1	1	4
6	−5	−7	−4	−3	−1	1	−2
7	3	6	1	−5	−4	2	1

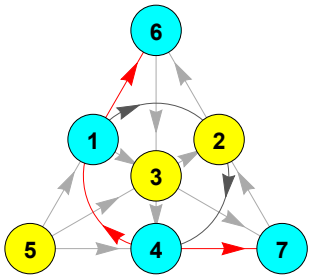
split=2

Fano plane



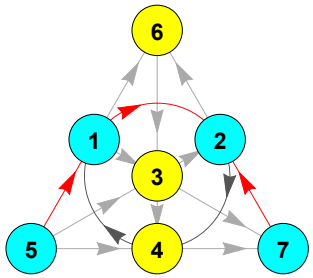
split=4

Fano plane



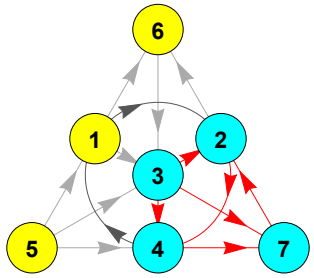
split=6

Fano plane



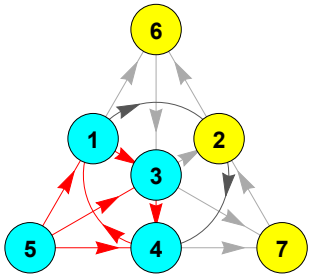
split=3

Fano plane



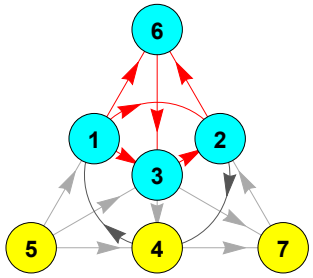
split=5

Fano plane



split=7

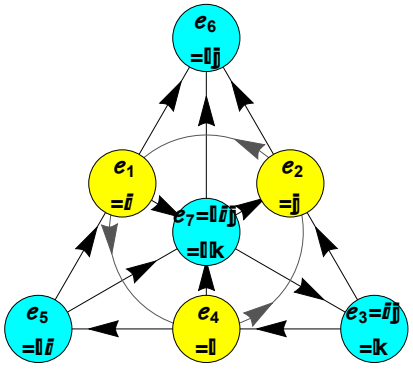
Fano plane



flip=True

{1, 4, 2}{1, 7, 3}{1, 6, 5}{2, 6, 3}{2, 5, 7}{3, 4, 5}{4, 7, 6}

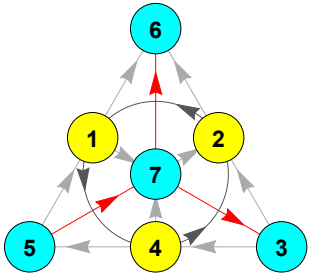
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_7$	e_2	$-e_6$	e_5	e_3
e_2	e_4	−1	$-e_6$	$-e_1$	e_7	e_3	$-e_5$
e_3	e_7	e_6	−1	e_5	$-e_4$	$-e_2$	$-e_1$
e_4	$-e_2$	e_1	$-e_5$	−1	e_3	$-e_7$	e_6
e_5	e_6	$-e_7$	e_4	$-e_3$	−1	$-e_1$	e_2
e_6	$-e_5$	$-e_3$	e_2	e_7	e_1	−1	$-e_4$
e_7	$-e_3$	e_5	e_1	$-e_6$	$-e_2$	e_4	−1

split=1

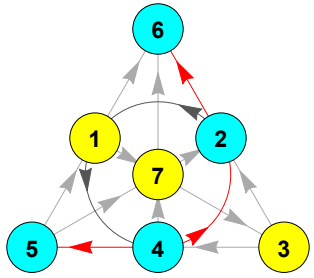
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−7	2	−6	5	3
2	4	−1	−6	−1	7	3	−5
3	7	6	1	5	4	2	1
4	−2	1	−5	−1	3	−7	6
5	6	−7	−4	−3	1	1	−2
6	−5	−3	−2	7	−1	1	4
7	−3	5	−1	−6	2	−4	1

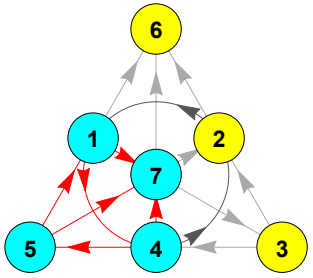
split=2

Fano plane



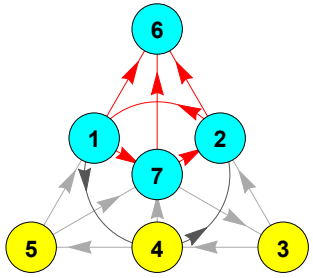
split=4

Fano plane



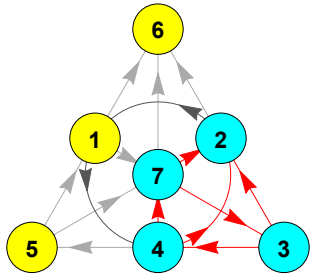
split=6

Fano plane



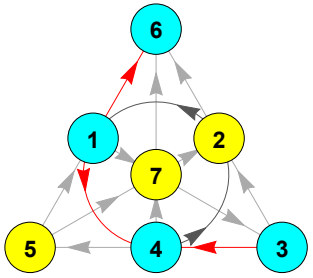
split=3

Fano plane



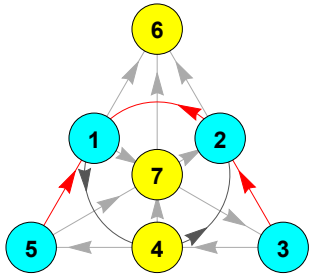
split=5

Fano plane



split=7

Fano plane

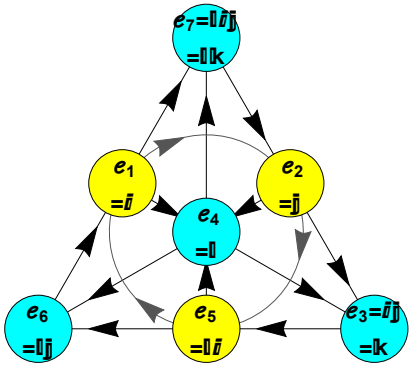


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
135	$\overline{\underset{m_m}{d}}^{1/3}_{R}$		0apggsscc 010011111_2	Bn{ 0 1 1 0 1 0 0 1 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Hf}$ 72

flip=False

{1, 2, 5}{1, 4, 3}{1, 7, 6}{2, 3, 7}{2, 4, 6}{3, 5, 6}{4, 7, 5}

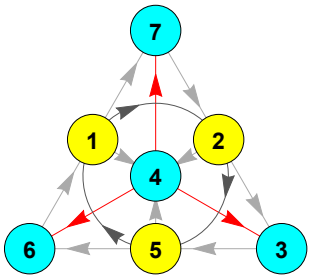
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	$-e_4$	e_3	$-e_2$	$-e_7$	e_6
e_2	$-e_5$	−1	e_7	e_6	e_1	$-e_4$	$-e_3$
e_3	e_4	$-e_7$	−1	$-e_1$	e_6	$-e_5$	e_2
e_4	$-e_3$	$-e_6$	e_1	−1	$-e_7$	e_2	e_5
e_5	e_2	$-e_1$	$-e_6$	e_7	−1	e_3	$-e_4$
e_6	e_7	e_4	e_5	$-e_2$	$-e_3$	−1	$-e_1$
e_7	$-e_6$	e_3	$-e_2$	$-e_5$	e_4	e_1	−1

split=1

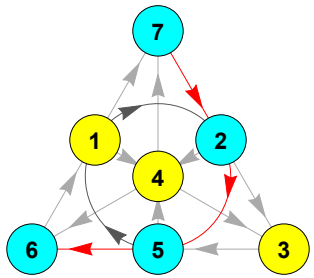
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−4	3	−2	−7	6
2	−5	−1	7	6	1	−4	−3
3	4	−7	1	1	6	5	−2
4	−3	−6	−1	1	−7	−2	−5
5	2	−1	−6	7	−1	3	−4
6	7	4	−5	2	−3	1	1
7	−6	3	2	5	4	−1	1

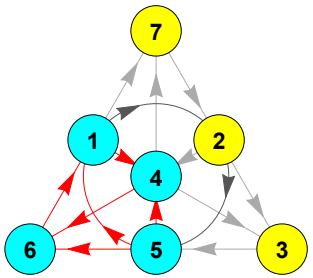
split=2

Fano plane



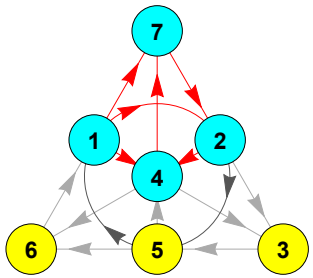
split=4

Fano plane



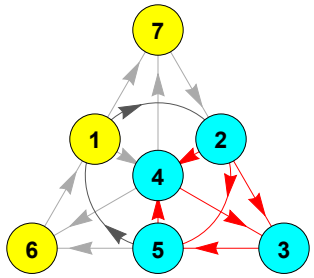
split=6

Fano plane



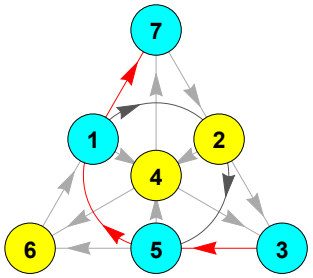
split=3

Fano plane



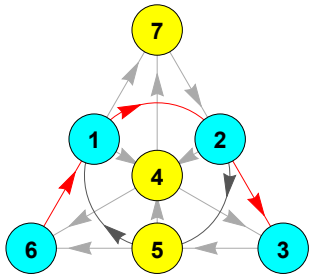
split=5

Fano plane



split=7

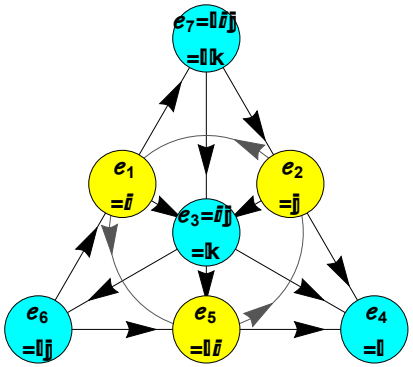
Fano plane



flip=True

{1, 5, 2}{1, 3, 4}{1, 7, 6}{2, 3, 6}{2, 4, 7}{3, 5, 7}{4, 6, 5}

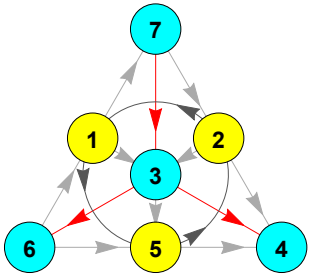
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_4	$-e_3$	e_2	$-e_7$	e_6
e_2	e_5	−1	e_6	e_7	$-e_1$	$-e_3$	$-e_4$
e_3	$-e_4$	$-e_6$	−1	e_1	e_7	e_2	$-e_5$
e_4	e_3	$-e_7$	$-e_1$	−1	$-e_6$	e_5	e_2
e_5	$-e_2$	e_1	$-e_7$	e_6	−1	$-e_4$	e_3
e_6	e_7	e_3	$-e_2$	$-e_5$	e_4	−1	$-e_1$
e_7	$-e_6$	e_4	e_5	$-e_2$	$-e_3$	e_1	−1

split=1

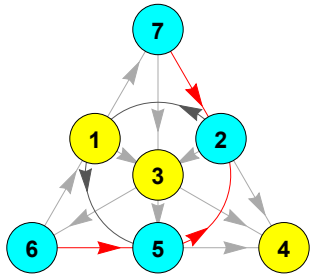
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	4	−3	2	−7	6
2	5	−1	6	7	−1	−3	−4
3	−4	−6	1	−1	7	−2	5
4	3	−7	1	1	−6	−5	−2
5	−2	1	−7	6	−1	−4	3
6	7	3	2	5	4	1	1
7	−6	4	−5	2	−3	−1	1

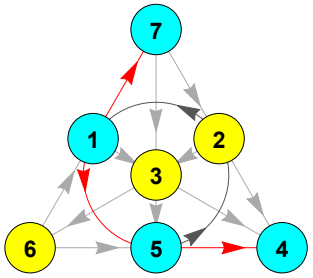
split=2

Fano plane



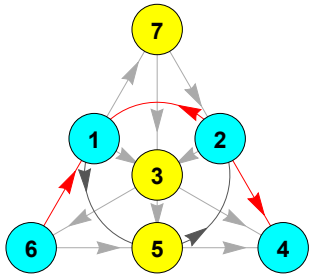
split=4

Fano plane



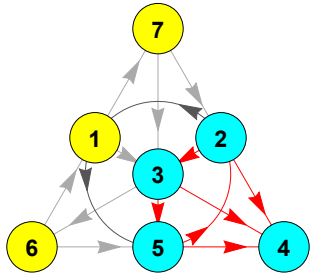
split=6

Fano plane



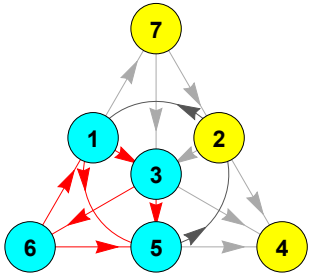
split=3

Fano plane



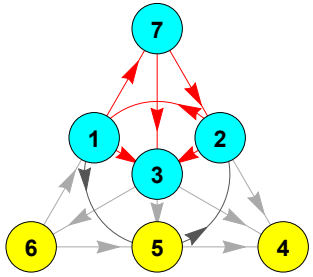
split=5

Fano plane



split=7

Fano plane

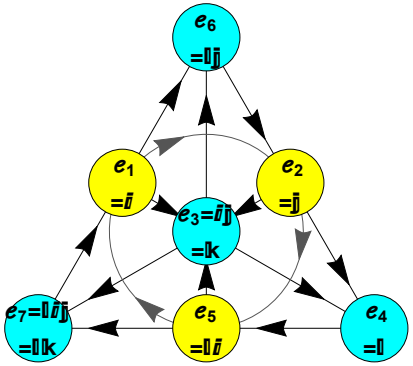


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
136	$u_{bm}^{2/3}$	■ ■	0apggsscc 001011011$_2$	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Lu 71

flip=False

{1, 2, 5}{1, 3, 4}{1, 6, 7}{2, 3, 7}{2, 4, 6}{3, 6, 5}{4, 5, 7}

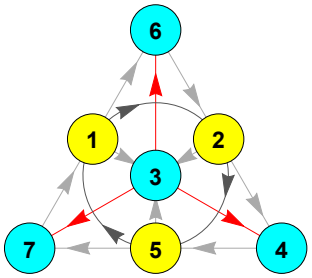
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	e_4	$-e_3$	$-e_2$	e_7	$-e_6$
e_2	e_2	$-e_5$	−1	e_7	e_6	e_1	$-e_4$	$-e_3$
e_3	e_3	$-e_4$	$-e_7$	−1	e_1	$-e_6$	e_5	e_2
e_4	e_4	e_3	$-e_6$	$-e_1$	−1	e_7	e_2	$-e_5$
e_5	e_5	e_2	$-e_1$	e_6	$-e_7$	−1	$-e_3$	e_4
e_6	e_6	$-e_7$	e_4	$-e_5$	$-e_2$	e_3	−1	e_1
e_7	e_7	e_6	e_3	$-e_2$	e_5	$-e_4$	$-e_1$	−1

split=1

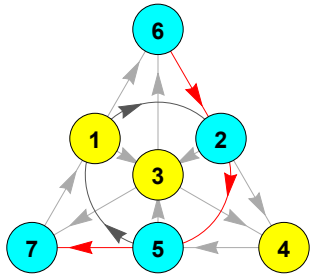
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	4	−3	−2	7	−6
2	−5	−1	7	6	1	−4	−3
3	−4	−7	1	−1	−6	−5	−2
4	3	−6	1	1	7	−2	5
5	2	−1	6	−7	−1	−3	4
6	−7	4	5	2	3	1	−1
7	6	3	2	−5	−4	1	1

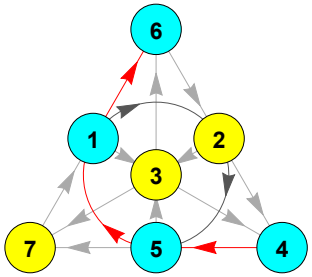
split=2

Fano plane



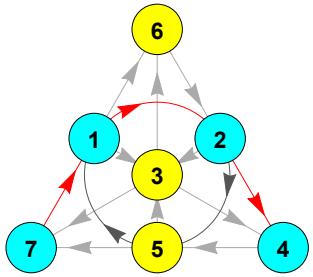
split=4

Fano plane



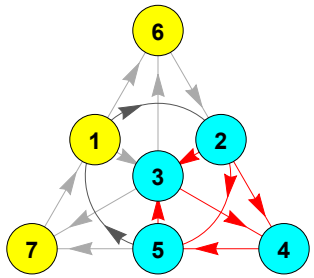
split=6

Fano plane



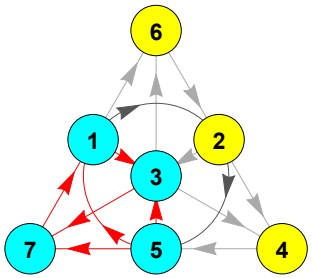
split=3

Fano plane



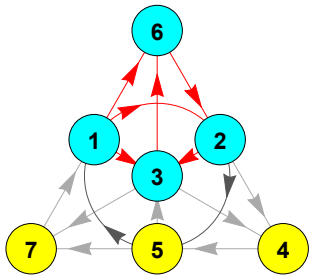
split=5

Fano plane



split=7

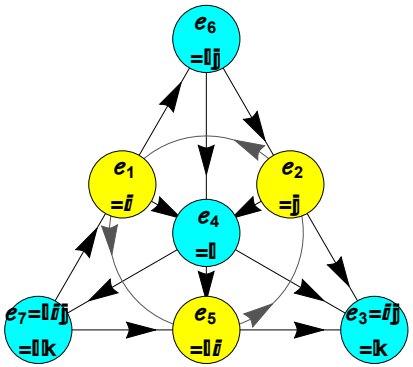
Fano plane



flip=True

{1, 5, 2}{1, 4, 3}{1, 6, 7}{2, 3, 6}{2, 4, 7}{3, 7, 5}{4, 5, 6}

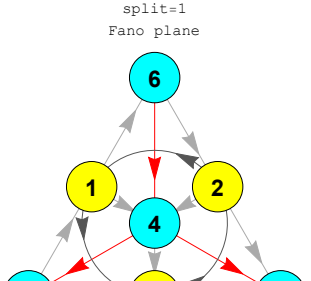
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_5$	$-e_4$	e_3	e_2	e_7	$-e_6$
e_2	e_2	e_5	−1	e_6	e_7	$-e_1$	$-e_3$	$-e_4$
e_3	e_3	e_4	$-e_6$	−1	$-e_1$	$-e_7$	e_2	e_5
e_4	e_4	$-e_3$	$-e_7$	e_1	−1	e_6	$-e_5$	e_2
e_5	e_5	$-e_2$	e_1	e_7	$-e_6$	−1	e_4	$-e_3$
e_6	e_6	$-e_7$	e_3	$-e_2$	e_5	$-e_4$	−1	e_1
e_7	e_7	e_6	e_4	$-e_5$	$-e_2$	e_3	$-e_1$	−1

split=1

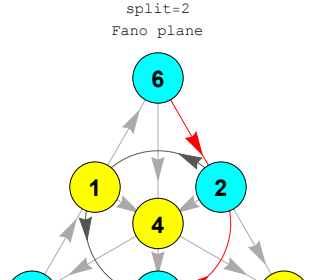
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−4	3	2	7	−6
2	5	−1	6	7	−1	−3	−4
3	4	−6	1	1	−7	−2	−5
4	−3	−7	−1	1	6	5	−2
5	−2	1	7	−6	−1	4	−3
6	−7	3	2	−5	−4	1	−1
7	6	4	5	2	3	1	1

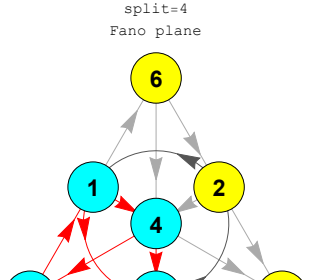
split=2

Fano plane



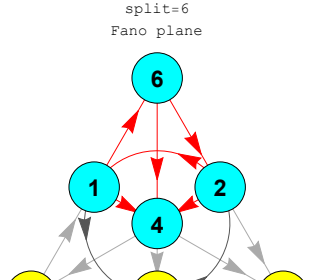
split=4

Fano plane



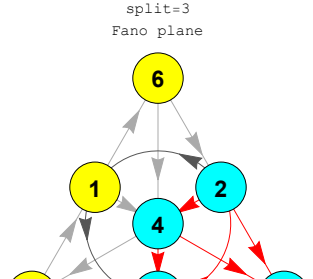
split=6

Fano plane



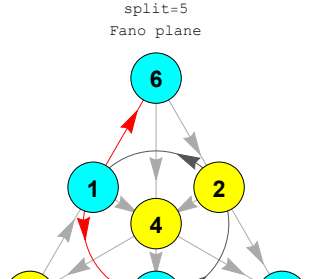
split=3

Fano plane



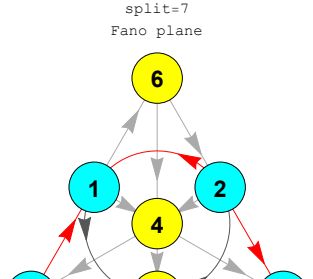
split=5

Fano plane



split=7

Fano plane

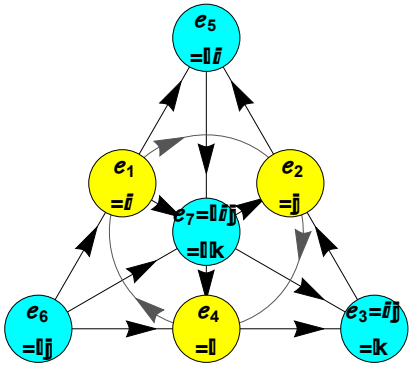


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
137	$\underset{gm}{u}^{0\to 2/3}_{t}$		0apggsscc 001011010_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Ir}}$ 77

flip=False

{1, 2, 4}{1, 7, 3}{1, 5, 6}{2, 5, 3}{2, 6, 7}{3, 6, 4}{4, 5, 7}

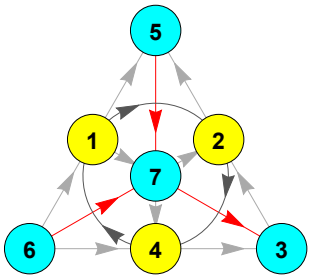
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_4	$-e_7$	$-e_2$	e_6	$-e_5$	e_3
e_2	e_2	$-e_4$	-1	$-e_5$	e_1	e_3	e_7	$-e_6$
e_3	e_3	e_7	e_5	-1	$-e_6$	$-e_2$	e_4	$-e_1$
e_4	e_4	e_2	$-e_1$	e_6	-1	e_7	$-e_3$	$-e_5$
e_5	e_5	$-e_6$	$-e_3$	e_2	$-e_7$	-1	e_1	e_4
e_6	e_6	e_5	$-e_7$	$-e_4$	e_3	$-e_1$	-1	e_2
e_7	e_7	$-e_3$	e_6	e_1	e_5	$-e_4$	$-e_2$	-1

split=1

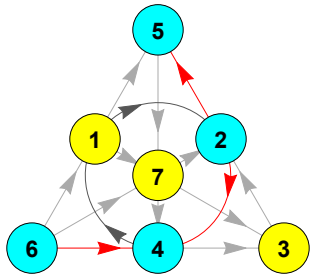
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	4	-7	-2	6	-5	3
2	-4	-1	-5	1	3	7	-6
3	7	5	1	-6	2	-4	1
4	2	-1	6	-1	7	-3	-5
5	-6	-3	-2	-7	1	-1	-4
6	5	-7	4	3	1	1	-2
7	-3	6	-1	5	4	2	1

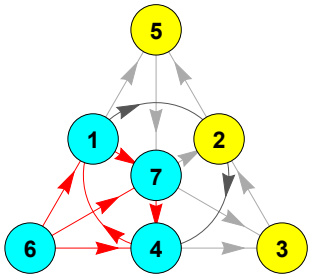
split=2

Fano plane



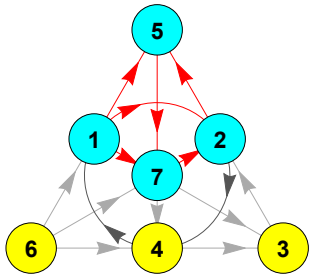
split=4

Fano plane



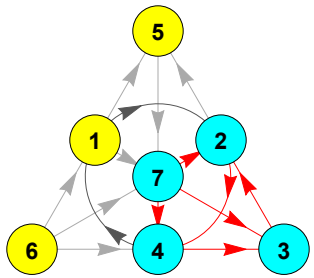
split=6

Fano plane



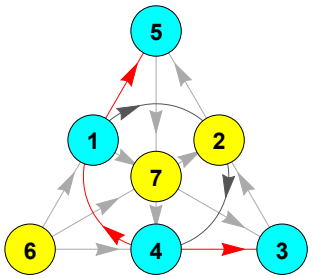
split=3

Fano plane



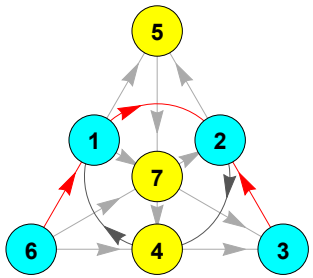
split=5

Fano plane



split=7

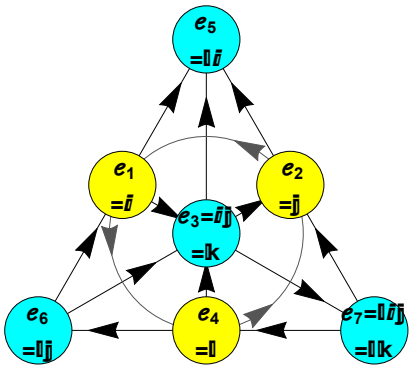
Fano plane



flip=True

{1, 4, 2}{1, 3, 7}{1, 5, 6}{2, 6, 3}{2, 5, 7}{3, 5, 4}{4, 6, 7}

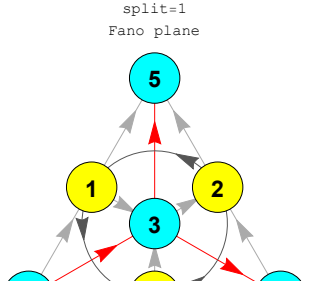
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	$-e_4$	e_7	e_2	e_6	$-e_5$	$-e_3$
e_2	e_4	-1	$-e_6$	$-e_1$	e_7	e_3	$-e_5$	
e_3	$-e_7$	e_6	-1	$-e_5$	e_4	$-e_2$	e_1	
e_4	$-e_2$	e_1	e_5	-1	$-e_3$	e_7	$-e_6$	
e_5	$-e_6$	$-e_7$	$-e_4$	e_3	-1	e_1	e_2	
e_6	e_5	$-e_3$	e_2	$-e_7$	$-e_1$	-1	e_4	
e_7	e_3	e_5	$-e_1$	e_6	$-e_2$	$-e_4$	-1	

split=1

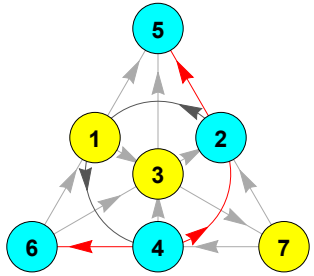
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	7	2	6	-5	-3
2	4	-1	-6	-1	7	3	-5
3	-7	6	1	-5	-4	2	-1
4	-2	1	5	-1	-3	7	-6
5	-6	-7	4	3	1	-1	-2
6	5	-3	-2	-7	1	1	-4
7	3	5	1	6	2	4	1

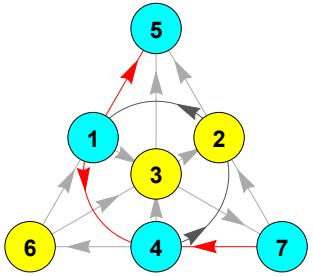
split=2

Fano plane



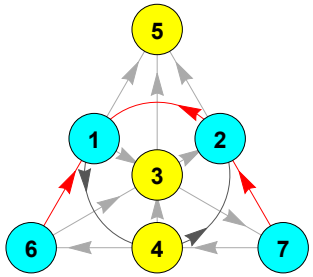
split=4

Fano plane



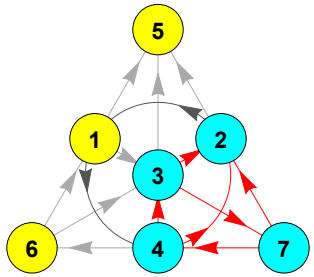
split=6

Fano plane



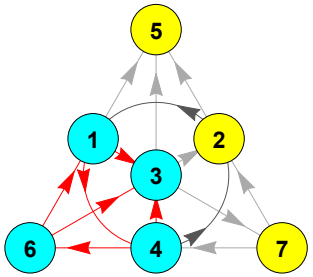
split=3

Fano plane



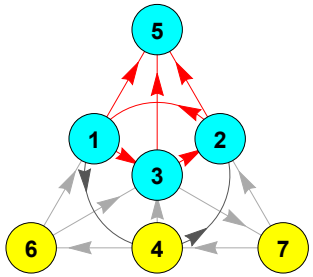
split=5

Fano plane



split=7

Fano plane

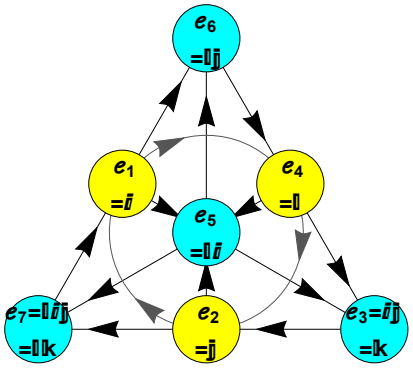


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
138	$\underset{r_m}{u}{}^{0\to 2/3}_{L}$	■ ■	0apggsscc 001011001_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{Pb}$ 82

flip=False

{1, 4, 2}{1, 5, 3}{1, 6, 7}{2, 7, 3}{2, 5, 6}{3, 6, 4}{4, 5, 7}

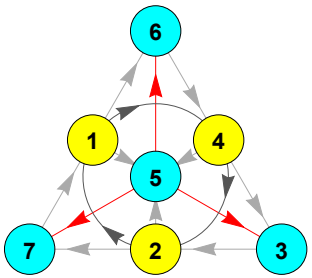
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_4$	$-e_5$	e_2	e_3	e_7	$-e_6$
e_2	e_2	e_4	−1	$-e_7$	$-e_1$	e_6	$-e_5$	e_3
e_3	e_3	e_5	e_7	−1	$-e_6$	$-e_1$	e_4	$-e_2$
e_4	e_4	$-e_2$	e_1	e_6	−1	e_7	$-e_3$	$-e_5$
e_5	e_5	$-e_3$	$-e_6$	e_1	$-e_7$	−1	e_2	e_4
e_6	e_6	$-e_7$	e_5	$-e_4$	e_3	$-e_2$	−1	e_1
e_7	e_7	e_6	$-e_3$	e_2	e_5	$-e_4$	$-e_1$	−1

split=1

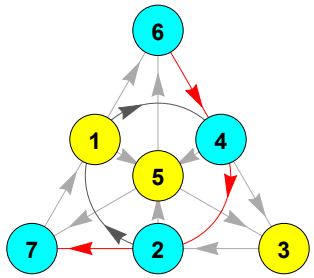
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−5	2	3	7	−6
2	4	−1	−7	−1	6	−5	3
3	5	7	1	−6	1	−4	2
4	−2	1	6	−1	7	−3	−5
5	−3	−6	−1	−7	1	−2	−4
6	−7	5	4	3	2	1	−1
7	6	−3	−2	5	4	1	1

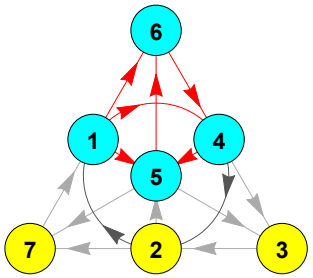
split=2

Fano plane



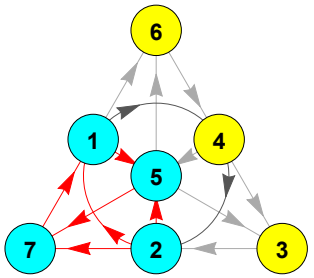
split=4

Fano plane



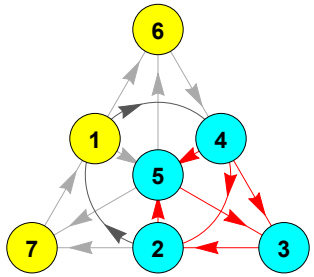
split=6

Fano plane



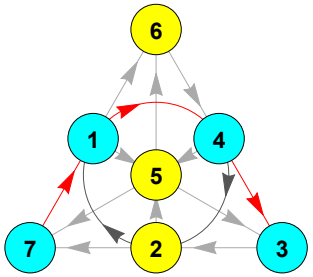
split=3

Fano plane



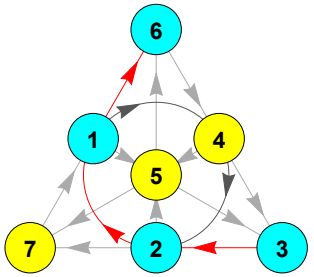
split=5

Fano plane



split=7

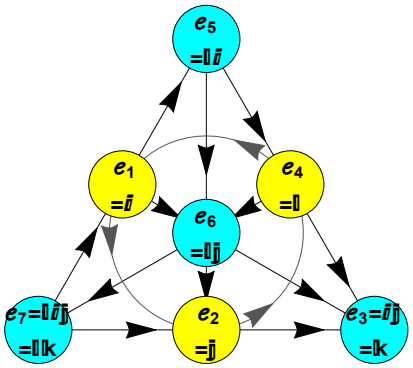
Fano plane



flip=True

{1, 2, 4}{1, 6, 3}{1, 5, 7}{2, 3, 7}{2, 5, 6}{3, 5, 4}{4, 6, 7}

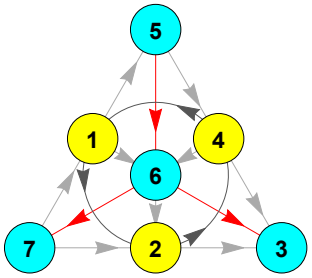
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	$-e_6$	$-e_2$	e_7	e_3	$-e_5$
e_2	e_2	$-e_4$	−1	e_7	e_1	e_6	$-e_5$	$-e_3$
e_3	e_3	e_6	$-e_7$	−1	$-e_5$	e_4	$-e_1$	e_2
e_4	e_4	e_2	$-e_1$	e_5	−1	$-e_3$	e_7	$-e_6$
e_5	e_5	$-e_7$	$-e_6$	$-e_4$	e_3	−1	e_2	e_1
e_6	e_6	$-e_3$	e_5	e_1	$-e_7$	$-e_2$	−1	e_4
e_7	e_7	e_5	e_3	$-e_2$	e_6	$-e_1$	$-e_4$	−1

split=1

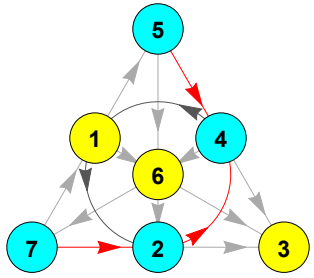
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−6	−2	7	3	−5
2	−4	−1	7	1	6	−5	−3
3	6	−7	1	−5	−4	1	−2
4	2	−1	5	−1	−3	7	−6
5	−7	−6	4	3	1	−2	−1
6	−3	5	−1	−7	2	1	−4
7	5	3	2	6	1	4	1

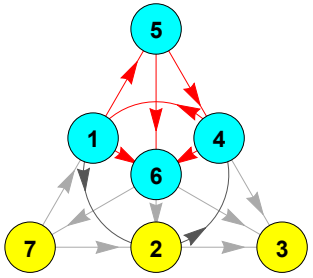
split=2

Fano plane



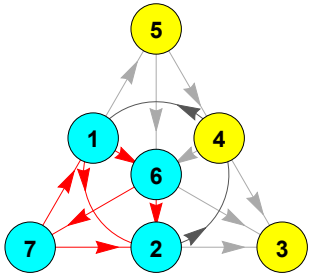
split=4

Fano plane



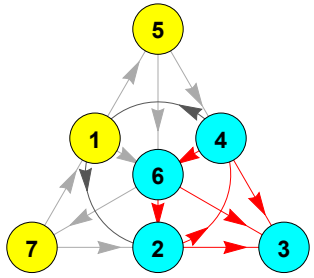
split=6

Fano plane



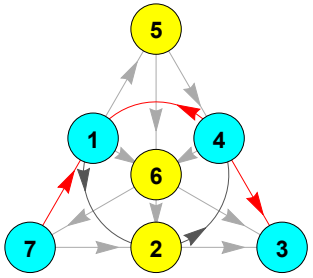
split=3

Fano plane



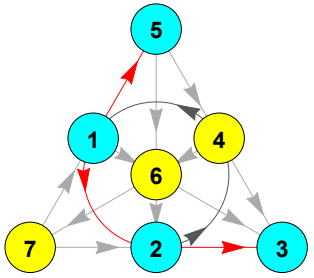
split=5

Fano plane



split=7

Fano plane

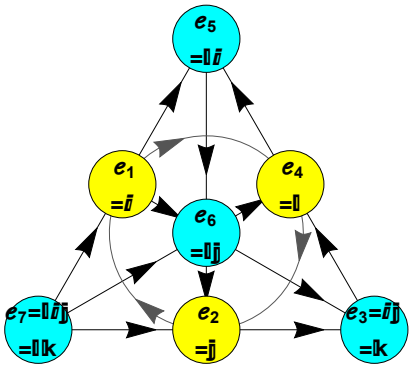


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
139	$\frac{\overline{u}^{0\to -2/3}}{r_m}$		0apggsscc 0110111101_2	Bn{ 0 1 0 1 1 1 0 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ }	Re 75

flip=False

{1, 4, 2}{1, 6, 3}{1, 5, 7}{2, 3, 7}{2, 5, 6}{3, 4, 5}{4, 7, 6}

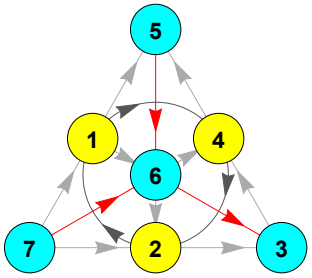
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_6$	e_2	e_7	e_3	$-e_5$
e_2	e_4	−1	e_7	$-e_1$	e_6	$-e_5$	$-e_3$
e_3	e_6	$-e_7$	−1	e_5	$-e_4$	$-e_1$	e_2
e_4	$-e_2$	e_1	$-e_5$	−1	e_3	$-e_7$	e_6
e_5	$-e_7$	$-e_6$	e_4	$-e_3$	−1	e_2	e_1
e_6	$-e_3$	e_5	e_1	e_7	$-e_2$	−1	$-e_4$
e_7	e_5	e_3	$-e_2$	$-e_6$	$-e_1$	e_4	−1

split=1

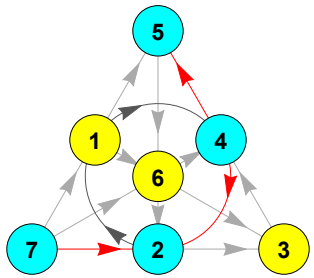
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−6	2	7	3	−5
2	4	−1	7	−1	6	−5	−3
3	6	−7	1	5	4	1	−2
4	−2	1	−5	−1	3	−7	6
5	−7	−6	−4	−3	1	−2	−1
6	−3	5	−1	7	2	1	4
7	5	3	2	−6	1	−4	1

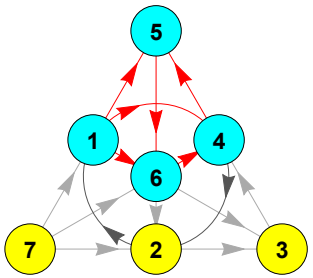
split=2

Fano plane



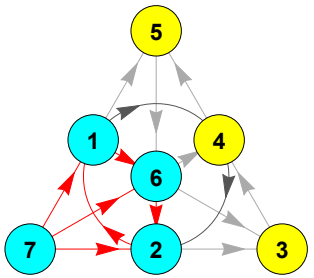
split=4

Fano plane



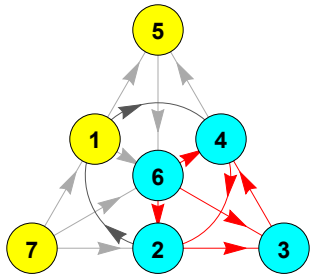
split=6

Fano plane



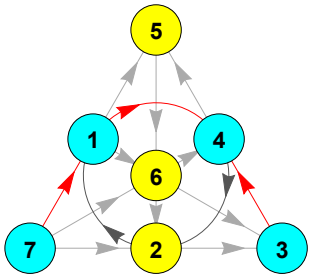
split=3

Fano plane



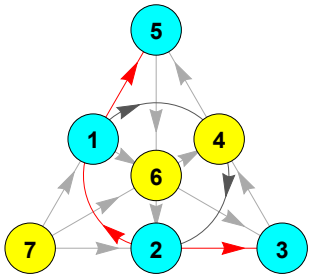
split=5

Fano plane



split=7

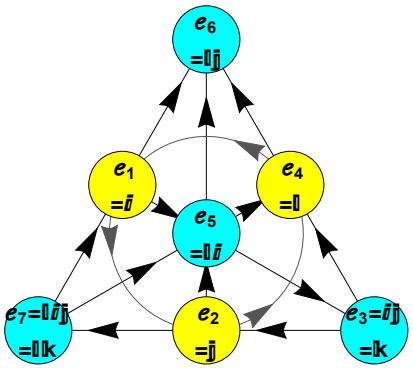
Fano plane



flip=True

{1, 2, 4}{1, 5, 3}{1, 6, 7}{2, 7, 3}{2, 5, 6}{3, 4, 6}{4, 7, 5}

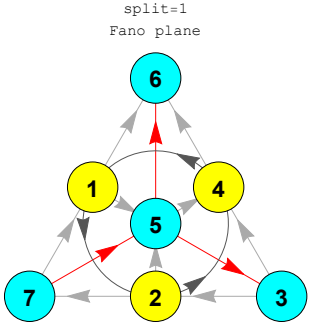
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_5$	$-e_2$	e_3	e_7	$-e_6$
e_2	$-e_4$	−1	$-e_7$	e_1	e_6	$-e_5$	e_3
e_3	e_5	e_7	−1	e_6	$-e_1$	$-e_4$	$-e_2$
e_4	e_2	$-e_1$	$-e_6$	−1	$-e_7$	e_3	e_5
e_5	$-e_3$	$-e_6$	e_1	e_7	−1	e_2	$-e_4$
e_6	$-e_7$	e_5	e_4	$-e_3$	$-e_2$	−1	e_1
e_7	e_6	$-e_3$	e_2	$-e_5$	e_4	$-e_1$	−1

split=1

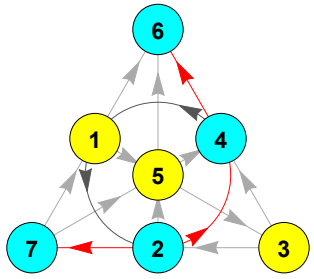
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−5	−2	3	7	−6
2	−4	−1	−7	1	6	−5	3
3	5	7	1	6	1	4	2
4	2	−1	−6	−1	−7	3	5
5	−3	−6	−1	7	1	−2	4
6	−7	5	−4	−3	2	1	−1
7	6	−3	−2	−5	−4	1	1

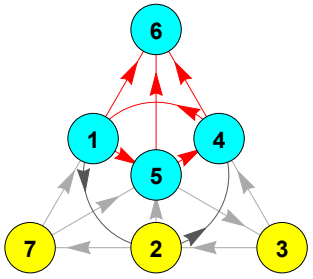
split=2

Fano plane



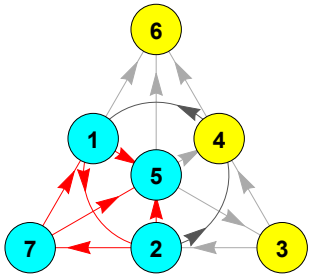
split=4

Fano plane



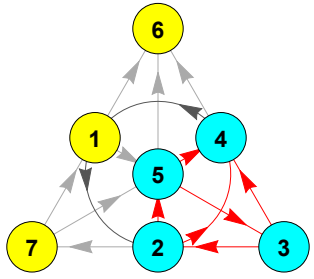
split=6

Fano plane



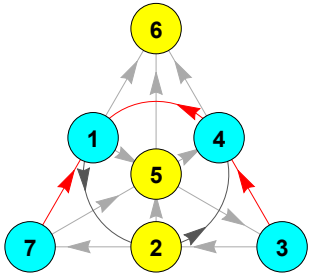
split=3

Fano plane



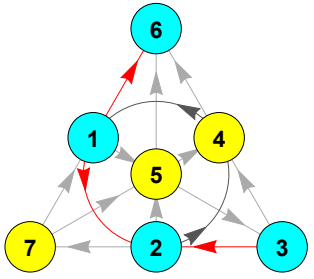
split=5

Fano plane



split=7

Fano plane

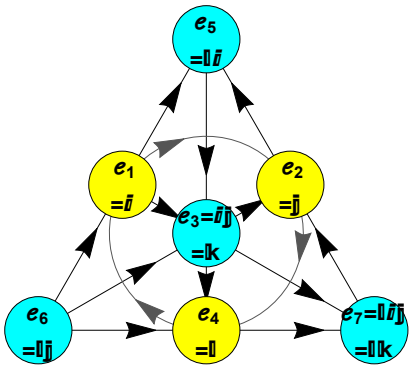


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
140	$\frac{\bar{u}}{g_m}^{0\to -2/3}_{\bar{R}}$		0apggsscc 0110111110$_2$	Bn{ 0 1 0 1 1 0 1 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Yb 70

flip=False

{1, 2, 4}{1, 3, 7}{1, 5, 6}{2, 6, 3}{2, 5, 7}{3, 4, 5}{4, 7, 6}

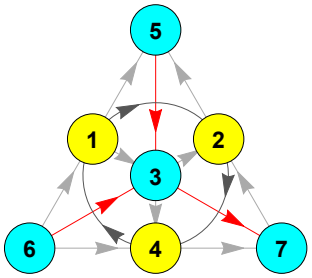
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_7	$-e_2$	e_6	$-e_5$	$-e_3$
e_2	$-e_4$	−1	$-e_6$	e_1	e_7	e_3	$-e_5$
e_3	$-e_7$	e_6	−1	e_5	$-e_4$	$-e_2$	e_1
e_4	e_2	$-e_1$	$-e_5$	−1	e_3	$-e_7$	e_6
e_5	$-e_6$	$-e_7$	e_4	$-e_3$	−1	e_1	e_2
e_6	e_5	$-e_3$	e_2	e_7	$-e_1$	−1	$-e_4$
e_7	e_3	e_5	$-e_1$	$-e_6$	$-e_2$	e_4	−1

split=1

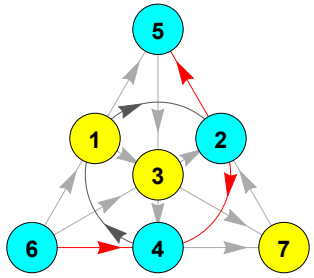
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	7	−2	6	−5	−3
2	−4	−1	−6	1	7	3	−5
3	−7	6	1	5	4	2	−1
4	2	−1	−5	−1	3	−7	6
5	−6	−7	−4	−3	1	−1	−2
6	5	−3	−2	7	1	1	4
7	3	5	1	−6	2	−4	1

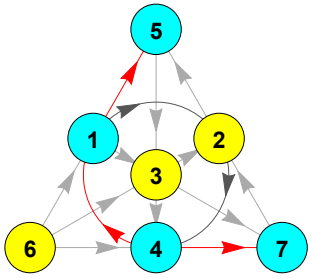
split=2

Fano plane



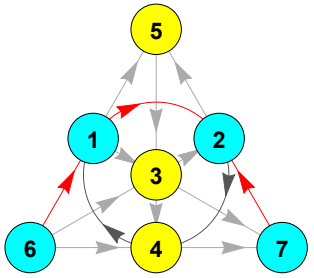
split=4

Fano plane



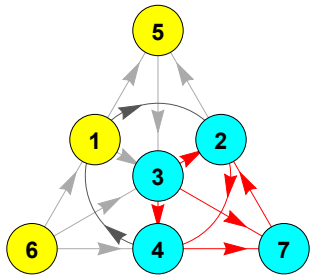
split=6

Fano plane



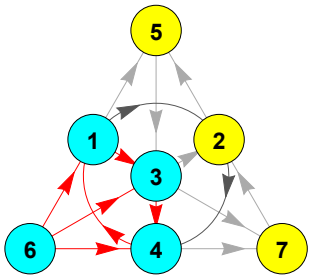
split=3

Fano plane



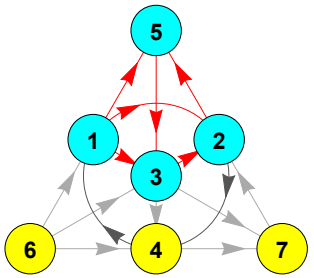
split=5

Fano plane



split=7

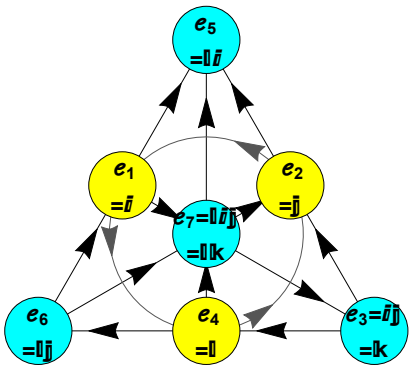
Fano plane



flip=True

{1, 4, 2}{1, 7, 3}{1, 5, 6}{2, 5, 3}{2, 6, 7}{3, 4, 6}{4, 7, 5}

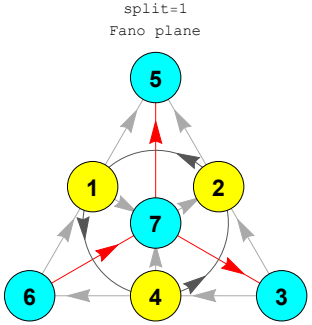
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_7$	e_2	e_6	$-e_5$	e_3
e_2	e_4	−1	$-e_5$	$-e_1$	e_3	e_7	$-e_6$
e_3	e_7	e_5	−1	e_6	$-e_2$	$-e_4$	$-e_1$
e_4	$-e_2$	e_1	$-e_6$	−1	$-e_7$	e_3	e_5
e_5	$-e_6$	$-e_3$	e_2	e_7	−1	e_1	$-e_4$
e_6	e_5	$-e_7$	e_4	$-e_3$	$-e_1$	−1	e_2
e_7	$-e_3$	e_6	e_1	$-e_5$	e_4	$-e_2$	−1

split=1

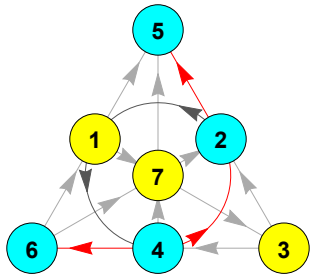
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−7	2	6	−5	3
2	4	−1	−5	−1	3	7	−6
3	7	5	1	6	2	4	1
4	−2	1	−6	−1	−7	3	5
5	−6	−3	−2	7	1	−1	4
6	5	−7	−4	−3	1	1	−2
7	−3	6	−1	−5	−4	2	1

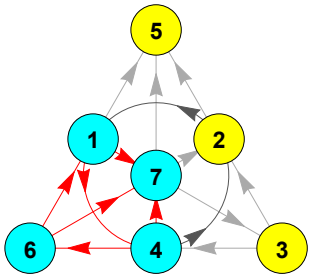
split=2

Fano plane



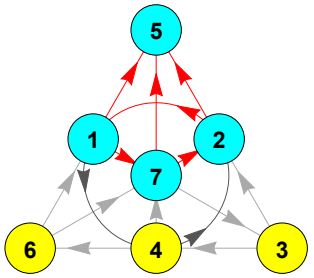
split=4

Fano plane



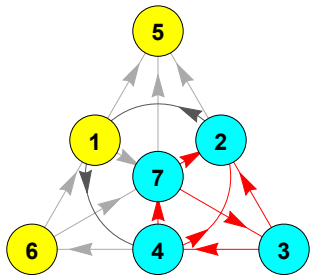
split=6

Fano plane



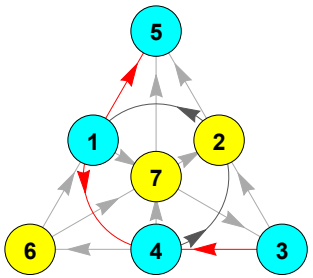
split=3

Fano plane



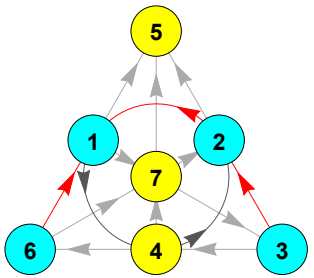
split=5

Fano plane



split=7

Fano plane

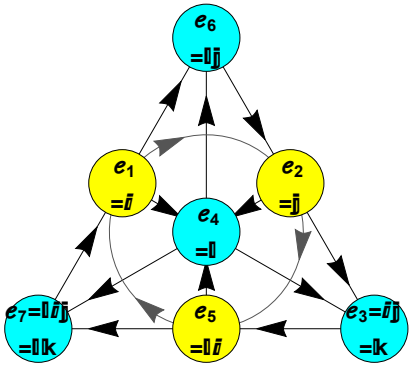


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
141	$\overline{\underset{\text{bm}}{\text{u}}}^{-2/3}_{\text{R}}$		0apggsscc 011011111$_2$	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Pt}}$ 78

flip=False

{1, 2, 5}{1, 4, 3}{1, 6, 7}{2, 3, 6}{2, 4, 7}{3, 5, 7}{4, 6, 5}

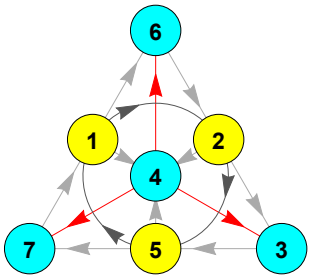
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	$-e_4$	e_3	$-e_2$	e_7	$-e_6$
e_2	$-e_5$	−1	e_6	e_7	e_1	$-e_3$	$-e_4$
e_3	e_4	$-e_6$	−1	$-e_1$	e_7	e_2	$-e_5$
e_4	$-e_3$	$-e_7$	e_1	−1	$-e_6$	e_5	e_2
e_5	e_2	$-e_1$	$-e_7$	e_6	−1	$-e_4$	e_3
e_6	$-e_7$	e_3	$-e_2$	$-e_5$	e_4	−1	e_1
e_7	e_6	e_4	e_5	$-e_2$	$-e_3$	$-e_1$	−1

split=1

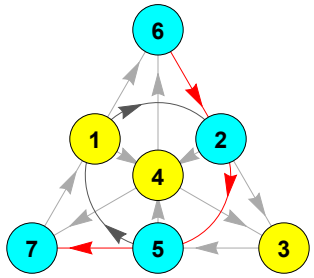
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−4	3	−2	7	−6
2	−5	−1	6	7	1	−3	−4
3	4	−6	1	1	7	−2	5
4	−3	−7	−1	1	−6	−5	−2
5	2	−1	−7	6	−1	−4	3
6	−7	3	2	5	4	1	−1
7	6	4	−5	2	−3	1	1

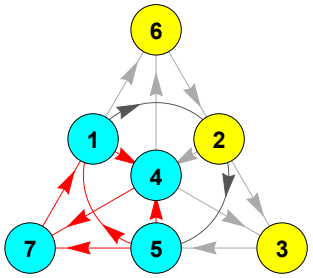
split=2

Fano plane



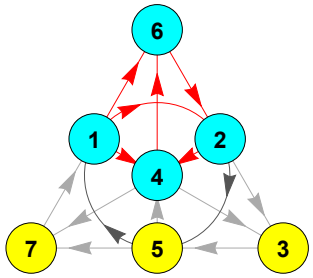
split=4

Fano plane



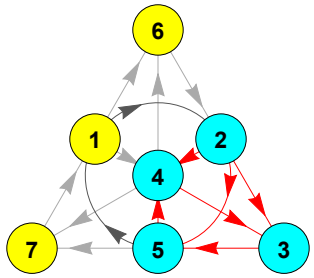
split=6

Fano plane



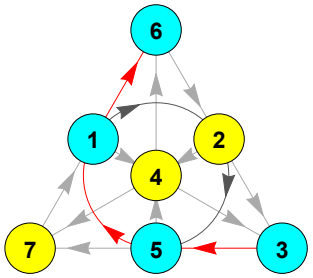
split=3

Fano plane



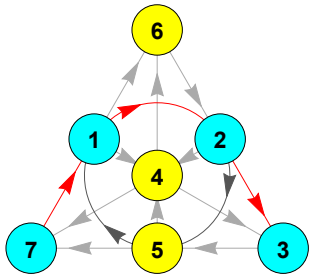
split=5

Fano plane



split=7

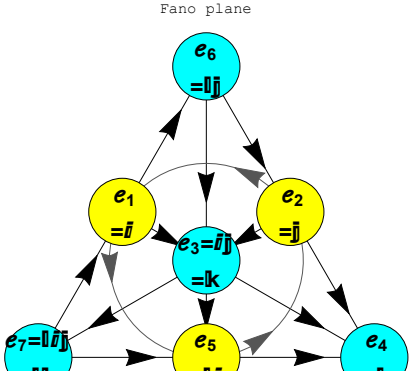
Fano plane



flip=True

{1, 5, 2}{1, 3, 4}{1, 6, 7}{2, 3, 7}{2, 4, 6}{3, 5, 6}{4, 7, 5}

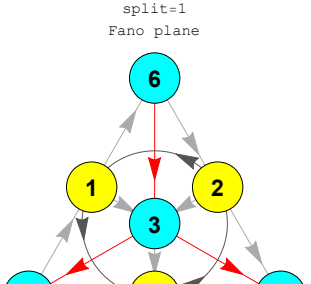
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_4	$-e_3$	e_2	e_7	$-e_6$
e_2	e_5	−1	e_7	e_6	$-e_1$	$-e_4$	$-e_3$
e_3	$-e_4$	$-e_7$	−1	e_1	e_6	$-e_5$	e_2
e_4	e_3	$-e_6$	$-e_1$	−1	$-e_7$	e_2	e_5
e_5	$-e_2$	e_1	$-e_6$	e_7	−1	e_3	$-e_4$
e_6	$-e_7$	e_4	e_5	$-e_2$	$-e_3$	−1	e_1
e_7	e_6	e_3	$-e_2$	$-e_5$	e_4	$-e_1$	−1

split=1

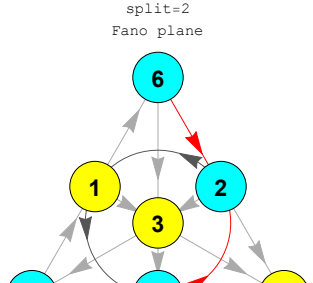
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	4	−3	2	7	−6
2	5	−1	7	6	−1	−4	−3
3	−4	−7	1	−1	6	5	−2
4	3	−6	1	1	−7	−2	−5
5	−2	1	−6	7	−1	3	−4
6	−7	4	−5	2	−3	1	−1
7	6	3	2	5	4	1	1

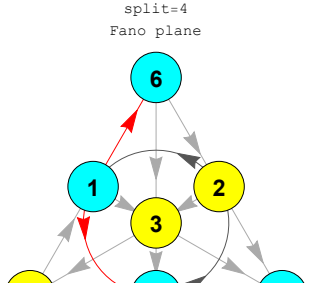
split=2

Fano plane



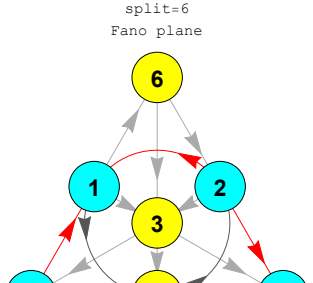
split=4

Fano plane



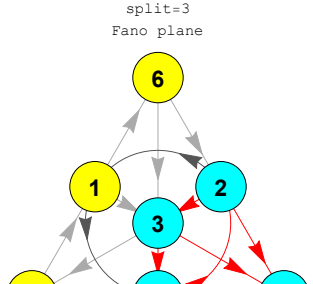
split=6

Fano plane



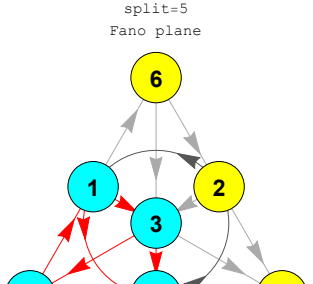
split=3

Fano plane



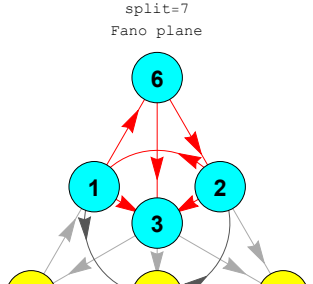
split=5

Fano plane



split=7

Fano plane

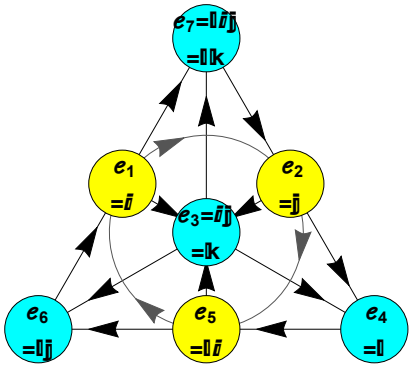


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
142	$d_{m_m}^{-1/3}$		0apggsscc 000011011_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Gd 64

flip=False

{1, 2, 5}{1, 3, 4}{1, 7, 6}{2, 3, 6}{2, 4, 7}{3, 7, 5}{4, 5, 6}

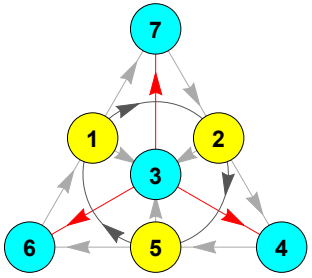
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	e_4	$-e_3$	$-e_2$	$-e_7$	e_6
e_2	e_2	$-e_5$	−1	e_6	e_7	e_1	$-e_3$	$-e_4$
e_3	e_3	$-e_4$	$-e_6$	−1	e_1	$-e_7$	e_2	e_5
e_4	e_4	e_3	$-e_7$	$-e_1$	−1	e_6	$-e_5$	e_2
e_5	e_5	e_2	$-e_1$	e_7	$-e_6$	−1	e_4	$-e_3$
e_6	e_6	e_7	e_3	$-e_2$	e_5	$-e_4$	−1	$-e_1$
e_7	e_7	$-e_6$	e_4	$-e_5$	$-e_2$	e_3	e_1	−1

split=1

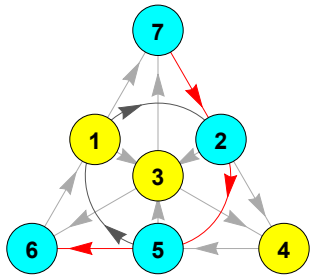
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	4	−3	−2	−7	6
2	−5	−1	6	7	1	−3	−4
3	−4	−6	1	−1	−7	−2	−5
4	3	−7	1	1	6	5	−2
5	2	−1	7	−6	−1	4	−3
6	7	3	2	−5	−4	1	1
7	−6	4	5	2	3	−1	1

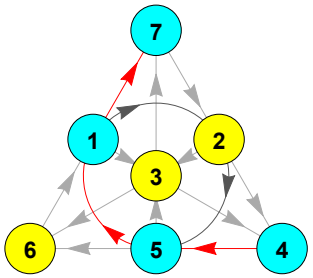
split=2

Fano plane



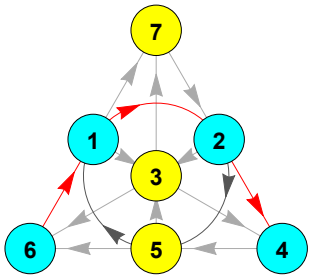
split=4

Fano plane



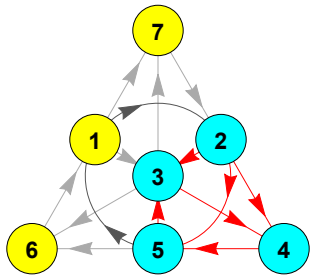
split=6

Fano plane



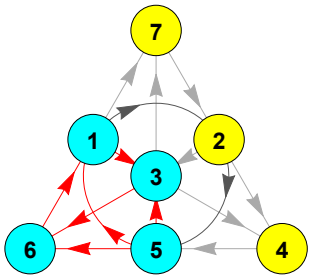
split=3

Fano plane



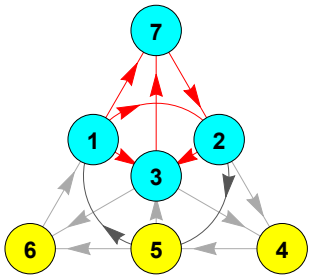
split=5

Fano plane



split=7

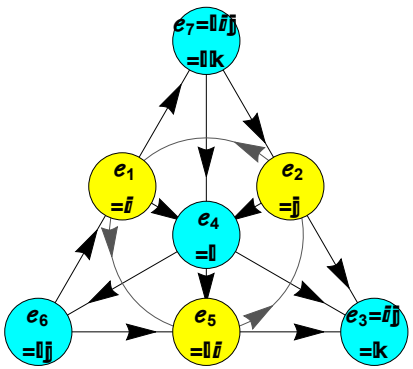
Fano plane



flip=True

{1, 5, 2}{1, 4, 3}{1, 7, 6}{2, 3, 7}{2, 4, 6}{3, 6, 5}{4, 5, 7}

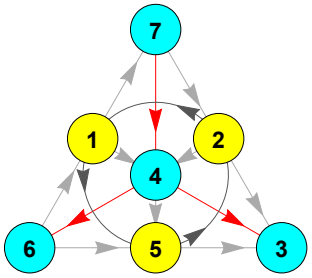
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_5$	$-e_4$	e_3	e_2	$-e_7$	e_6
e_2	e_2	e_5	−1	e_7	e_6	$-e_1$	$-e_4$	$-e_3$
e_3	e_3	e_4	$-e_7$	−1	$-e_1$	$-e_6$	e_5	e_2
e_4	e_4	$-e_3$	$-e_6$	e_1	−1	e_7	e_2	$-e_5$
e_5	e_5	$-e_2$	e_1	e_6	$-e_7$	−1	$-e_3$	e_4
e_6	e_6	e_7	e_4	$-e_5$	$-e_2$	e_3	−1	$-e_1$
e_7	e_7	$-e_6$	e_3	$-e_2$	e_5	$-e_4$	e_1	−1

split=1

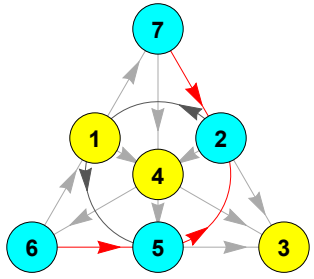
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−4	3	2	−7	6
2	5	−1	7	6	−1	−4	−3
3	4	−7	1	1	−6	−5	−2
4	−3	−6	−1	1	7	−2	5
5	−2	1	6	−7	−1	−3	4
6	7	4	5	2	3	1	1
7	−6	3	2	−5	−4	−1	1

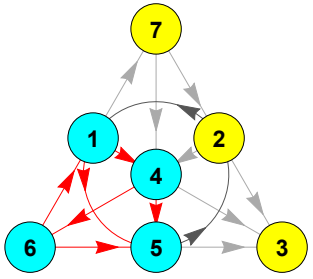
split=2

Fano plane



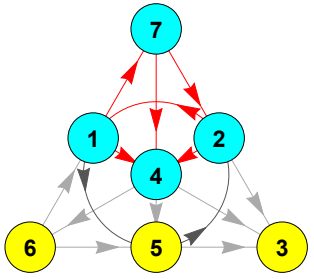
split=4

Fano plane



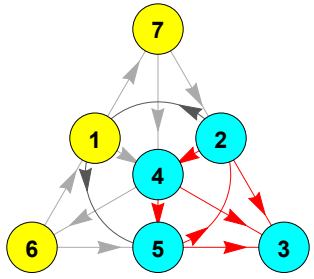
split=6

Fano plane



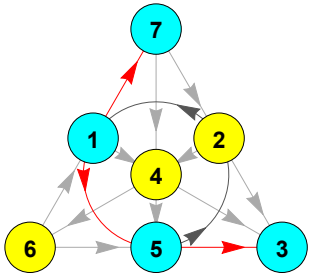
split=3

Fano plane



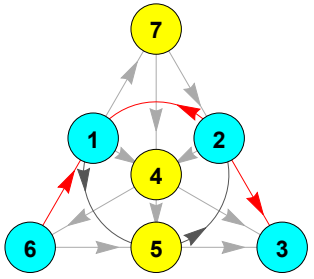
split=5

Fano plane



split=7

Fano plane

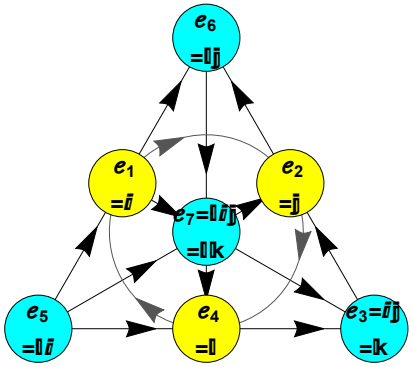


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
143	$d_{c_m}^{\rightarrow -1/3}$	■ ◆	0apggsscc 0000110101_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{Bi}$ 83

flip=False

{1, 2, 4}{1, 7, 3}{1, 6, 5}{2, 6, 3}{2, 5, 7}{3, 5, 4}{4, 6, 7}

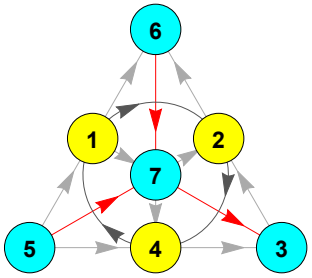
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_7$	$-e_2$	$-e_6$	e_5	e_3
e_2	$-e_4$	−1	$-e_6$	e_1	e_7	e_3	$-e_5$
e_3	e_7	e_6	−1	$-e_5$	e_4	$-e_2$	$-e_1$
e_4	e_2	$-e_1$	e_5	−1	$-e_3$	e_7	$-e_6$
e_5	e_6	$-e_7$	$-e_4$	e_3	−1	$-e_1$	e_2
e_6	$-e_5$	$-e_3$	e_2	$-e_7$	e_1	−1	e_4
e_7	$-e_3$	e_5	e_1	e_6	$-e_2$	$-e_4$	−1

split=1

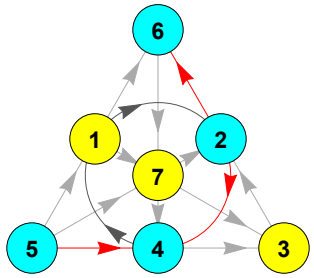
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−7	−2	−6	5	3
2	−4	−1	−6	1	7	3	−5
3	7	6	1	−5	−4	2	1
4	2	−1	5	−1	−3	7	−6
5	6	−7	4	3	1	1	−2
6	−5	−3	−2	−7	−1	1	−4
7	−3	5	−1	6	2	4	1

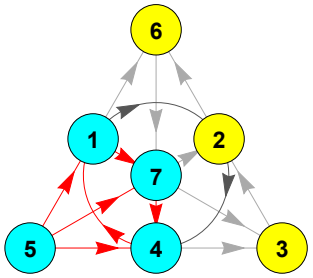
split=2

Fano plane



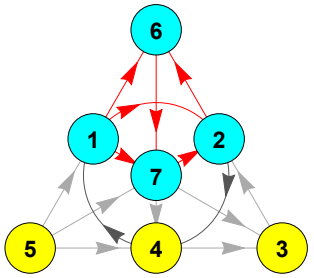
split=4

Fano plane



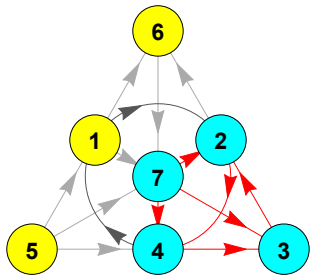
split=6

Fano plane



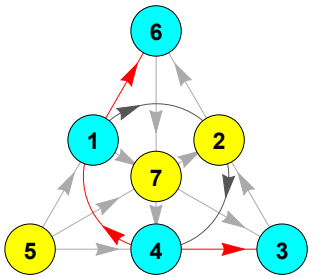
split=3

Fano plane



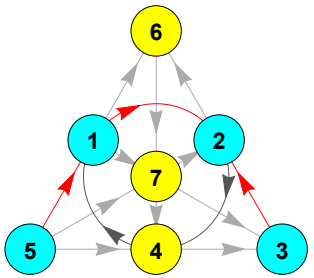
split=5

Fano plane



split=7

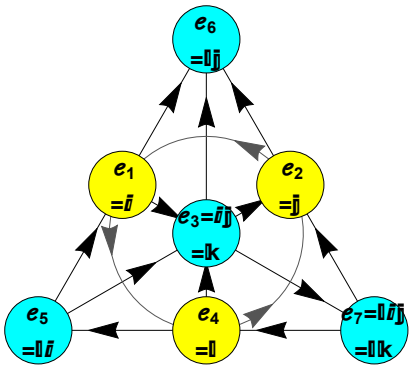
Fano plane



flip=True

{1, 4, 2}{1, 3, 7}{1, 6, 5}{2, 5, 3}{2, 6, 7}{3, 6, 4}{4, 5, 7}

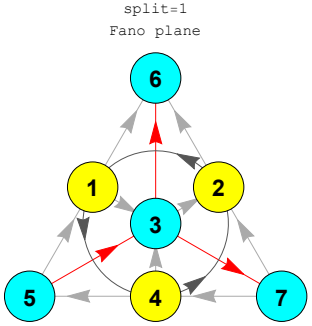
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_7	e_2	$-e_6$	e_5	$-e_3$
e_2	e_4	−1	$-e_5$	$-e_1$	e_3	e_7	$-e_6$
e_3	$-e_7$	e_5	−1	$-e_6$	$-e_2$	e_4	e_1
e_4	$-e_2$	e_1	e_6	−1	e_7	$-e_3$	$-e_5$
e_5	e_6	$-e_3$	e_2	$-e_7$	−1	$-e_1$	e_4
e_6	$-e_5$	$-e_7$	$-e_4$	e_3	e_1	−1	e_2
e_7	e_3	e_6	$-e_1$	e_5	$-e_4$	$-e_2$	−1

split=1

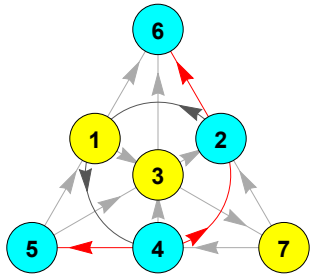
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	7	2	−6	5	−3
2	4	−1	−5	−1	3	7	−6
3	−7	5	1	−6	2	−4	−1
4	−2	1	6	−1	7	−3	−5
5	6	−3	−2	−7	1	1	−4
6	−5	−7	4	3	−1	1	−2
7	3	6	1	5	4	2	1

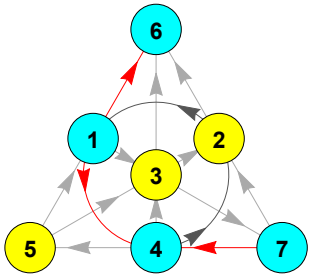
split=2

Fano plane



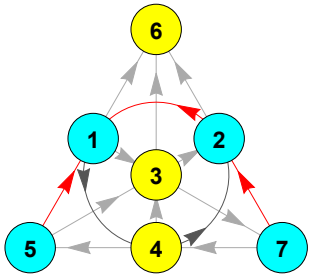
split=4

Fano plane



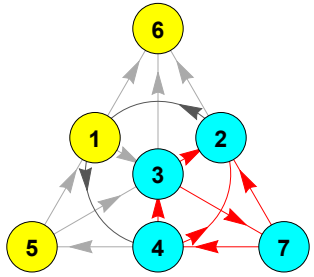
split=6

Fano plane



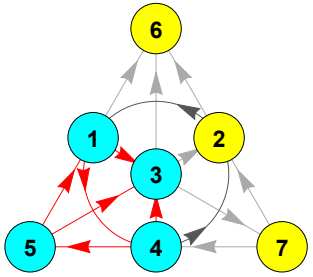
split=3

Fano plane



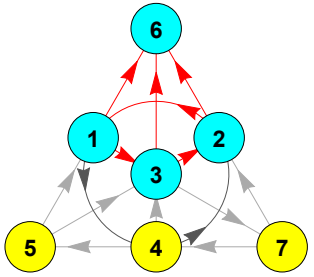
split=5

Fano plane



split=7

Fano plane

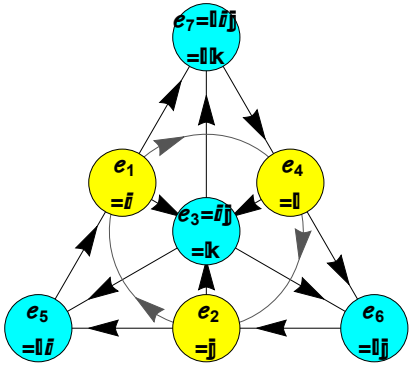


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
144	$\overset{\to -1/3}{\underset{\circ_m}{d}}$		0apggsscc 0000110012_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Rn}}$ 86

flip=False

{1, 4, 2}{1, 3, 6}{1, 7, 5}{2, 3, 7}{2, 5, 6}{3, 5, 4}{4, 6, 7}

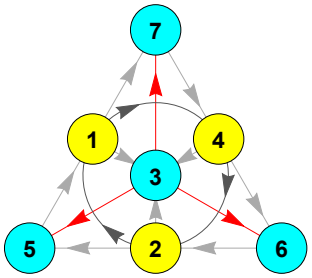
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_6	e_2	$-e_7$	$-e_3$	e_5
e_2	e_4	−1	e_7	$-e_1$	e_6	$-e_5$	$-e_3$
e_3	$-e_6$	$-e_7$	−1	$-e_5$	e_4	e_1	e_2
e_4	$-e_2$	e_1	e_5	−1	$-e_3$	e_7	$-e_6$
e_5	e_7	$-e_6$	$-e_4$	e_3	−1	e_2	$-e_1$
e_6	e_3	e_5	$-e_1$	$-e_7$	$-e_2$	−1	e_4
e_7	$-e_5$	e_3	$-e_2$	e_6	e_1	$-e_4$	−1

split=1

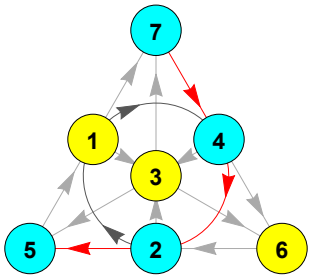
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	6	2	−7	−3	5
2	4	−1	7	−1	6	−5	−3
3	−6	−7	1	−5	−4	−1	−2
4	−2	1	5	−1	−3	7	−6
5	7	−6	4	3	1	−2	1
6	3	5	1	−7	2	1	−4
7	−5	3	2	6	−1	4	1

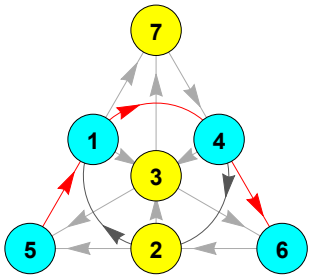
split=2

Fano plane



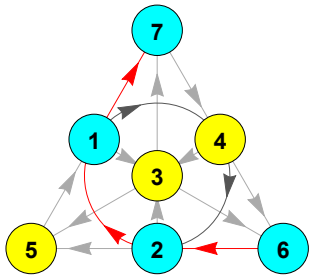
split=4

Fano plane



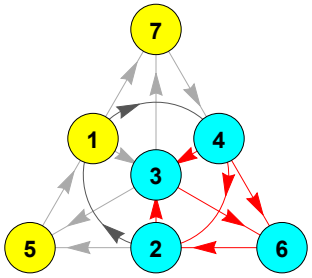
split=6

Fano plane



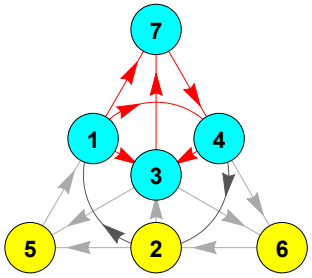
split=3

Fano plane



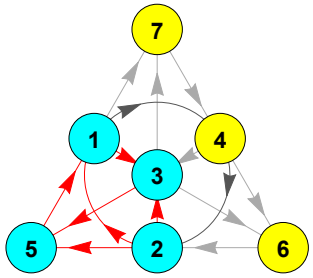
split=5

Fano plane



split=7

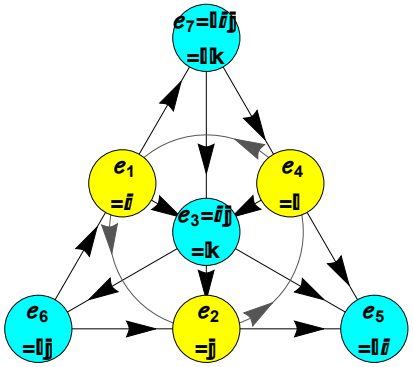
Fano plane



flip=True

{1, 2, 4}{1, 3, 5}{1, 7, 6}{2, 7, 3}{2, 5, 6}{3, 6, 4}{4, 5, 7}

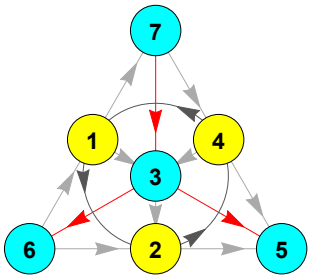
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_5	$-e_2$	$-e_3$	$-e_7$	e_6
e_2	$-e_4$	−1	$-e_7$	e_1	e_6	$-e_5$	e_3
e_3	$-e_5$	e_7	−1	$-e_6$	e_1	e_4	$-e_2$
e_4	e_2	$-e_1$	e_6	−1	e_7	$-e_3$	$-e_5$
e_5	e_3	$-e_6$	$-e_1$	$-e_7$	−1	e_2	e_4
e_6	e_7	e_5	$-e_4$	e_3	$-e_2$	−1	$-e_1$
e_7	$-e_6$	$-e_3$	e_2	e_5	$-e_4$	e_1	−1

split=1

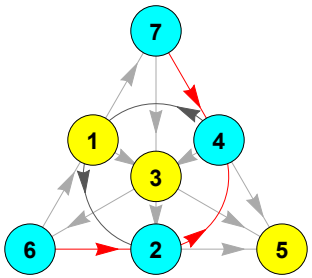
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	5	−2	−3	−7	6
2	−4	−1	−7	1	6	−5	3
3	−5	7	1	−6	−1	−4	2
4	2	−1	6	−1	7	−3	−5
5	3	−6	1	−7	1	−2	−4
6	7	5	4	3	2	1	1
7	−6	−3	−2	5	4	−1	1

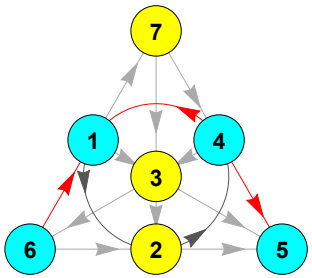
split=2

Fano plane



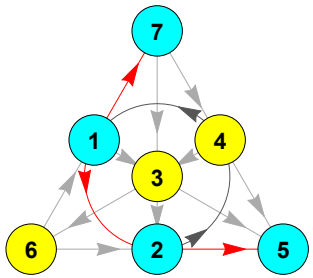
split=4

Fano plane



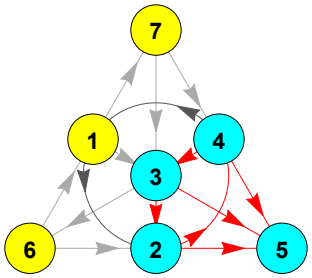
split=6

Fano plane



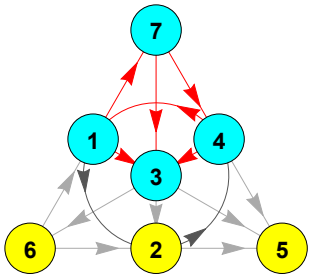
split=3

Fano plane



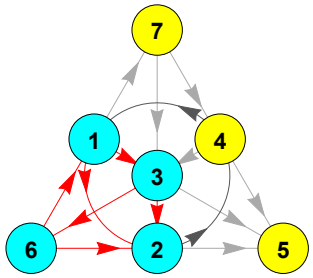
split=5

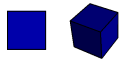
Fano plane



split=7

Fano plane

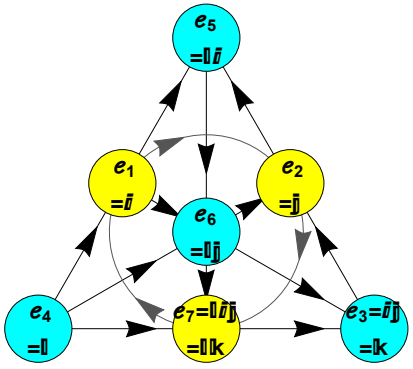


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
145	$t_{b_d}^{2/3}$		0apggsscc 001110011_2	Bn{ 0 1 0 0 1 1 1 0 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Ce 58

flip=False

{1, 2, 7}{1, 6, 3}{1, 5, 4}{2, 5, 3}{2, 4, 6}{3, 4, 7}{5, 6, 7}

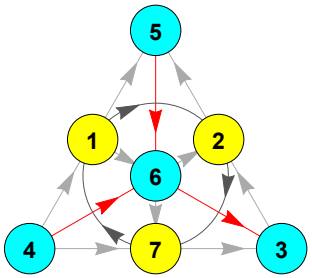
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	$-e_6$	$-e_5$	e_4	e_3	$-e_2$
e_2	e_2	$-e_7$	−1	$-e_5$	e_6	e_3	$-e_4$	e_1
e_3	e_3	e_6	e_5	−1	e_7	$-e_2$	$-e_1$	$-e_4$
e_4	e_4	e_5	$-e_6$	$-e_7$	−1	$-e_1$	e_2	e_3
e_5	e_5	$-e_4$	$-e_3$	e_2	e_1	−1	e_7	$-e_6$
e_6	e_6	$-e_3$	e_4	e_1	$-e_2$	$-e_7$	−1	e_5
e_7	e_7	e_2	$-e_1$	e_4	$-e_3$	e_6	$-e_5$	−1

split=1

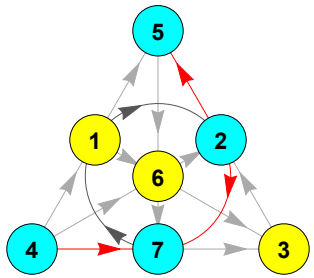
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−6	−5	4	3	−2
2	−7	−1	−5	6	3	−4	1
3	6	5	1	−7	2	1	−4
4	5	−6	7	1	1	−2	3
5	−4	−3	−2	−1	1	−7	−6
6	−3	4	−1	2	7	1	5
7	2	−1	4	−3	6	−5	−1

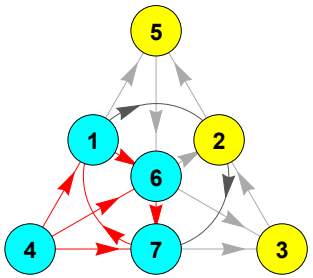
split=2

Fano plane



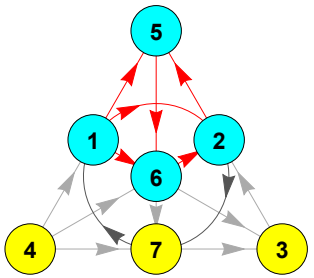
split=4

Fano plane



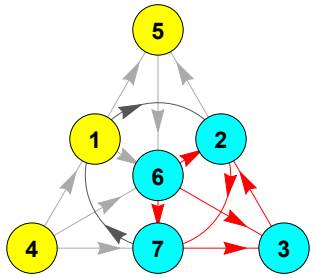
split=6

Fano plane



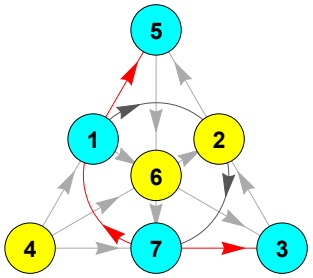
split=3

Fano plane



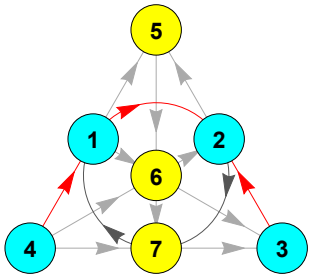
split=5

Fano plane



split=7

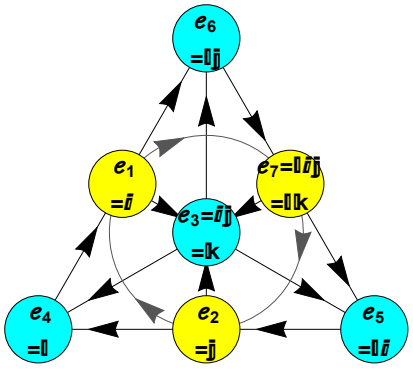
Fano plane



flip=True

{1, 7, 2}{1, 3, 5}{1, 6, 4}{2, 3, 6}{2, 4, 5}{3, 4, 7}{5, 6, 7}

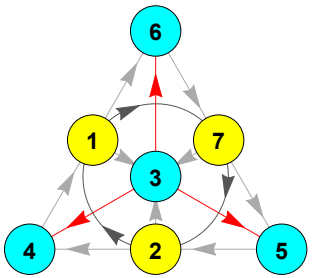
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	e_5	$-e_6$	$-e_3$	e_4	e_2
e_2	e_2	e_7	−1	e_6	e_5	$-e_4$	$-e_3$	$-e_1$
e_3	e_3	$-e_5$	$-e_6$	−1	e_7	e_1	e_2	$-e_4$
e_4	e_4	e_6	$-e_5$	$-e_7$	−1	e_2	$-e_1$	e_3
e_5	e_5	e_3	e_4	$-e_1$	$-e_2$	−1	e_7	$-e_6$
e_6	e_6	$-e_4$	e_3	$-e_2$	e_1	$-e_7$	−1	e_5
e_7	e_7	$-e_2$	e_1	e_4	$-e_3$	e_6	$-e_5$	−1

split=1

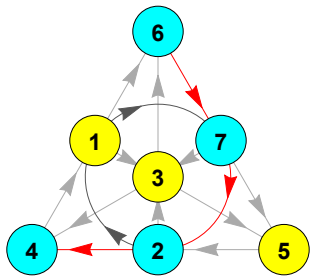
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	5	−6	−3	4	2
2	7	−1	6	5	−4	−3	−1
3	−5	−6	1	−7	−1	−2	−4
4	6	−5	7	1	−2	1	3
5	3	4	1	2	1	−7	−6
6	−4	3	2	−1	7	1	5
7	−2	1	4	−3	6	−5	−1

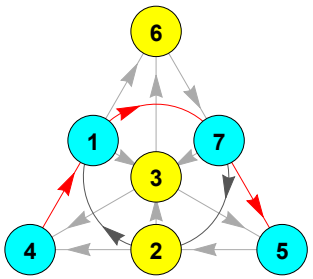
split=2

Fano plane



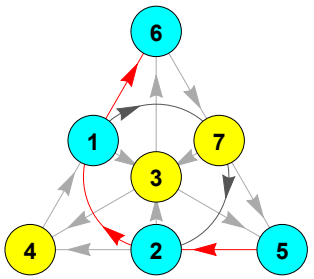
split=4

Fano plane



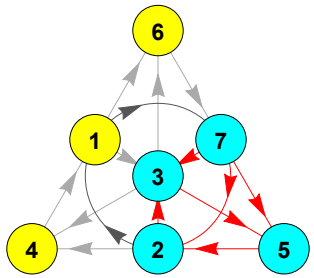
split=6

Fano plane



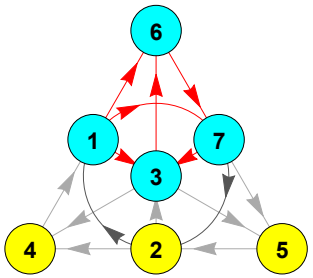
split=3

Fano plane



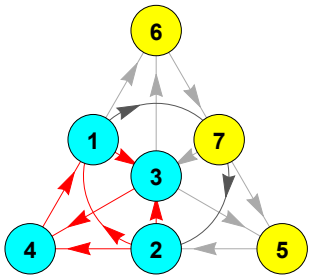
split=5

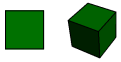
Fano plane



split=7

Fano plane

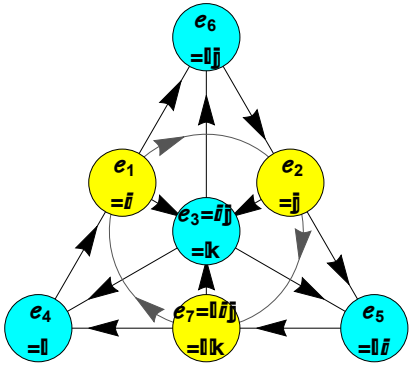


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
146	$t_{g_d}^{0\to 2/3}$		0apggsscc 001110010_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Fr}}$ 87

flip=False

{1, 2, 7}{1, 3, 5}{1, 6, 4}{2, 3, 4}{2, 5, 6}{3, 6, 7}{4, 5, 7}

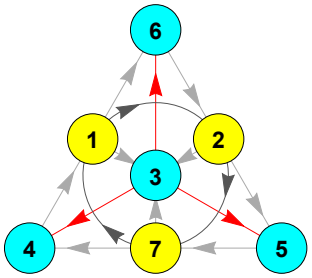
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	e_5	$-e_6$	$-e_3$	e_4	$-e_2$
e_2	e_2	$-e_7$	−1	e_4	$-e_3$	e_6	$-e_5$	e_1
e_3	e_3	$-e_4$	$-e_1$	−1	e_2	e_1	e_7	$-e_6$
e_4	e_4	e_6	e_3	$-e_2$	−1	e_7	$-e_1$	$-e_5$
e_5	e_5	e_3	$-e_6$	$-e_1$	$-e_7$	−1	e_2	e_4
e_6	e_6	$-e_4$	e_5	$-e_7$	e_1	$-e_2$	−1	e_3
e_7	e_7	e_2	$-e_1$	e_6	e_5	$-e_4$	$-e_3$	−1

split=1

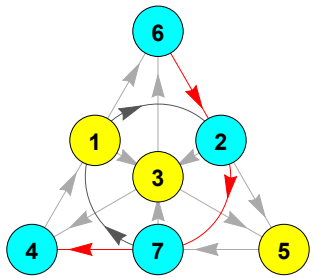
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	5	−6	−3	4	−2
2	−7	−1	4	−3	6	−5	1
3	−5	−4	1	−2	−1	−7	−6
4	6	3	2	1	−7	1	−5
5	3	−6	1	7	1	−2	4
6	−4	5	7	−1	2	1	3
7	2	−1	6	5	−4	−3	−1

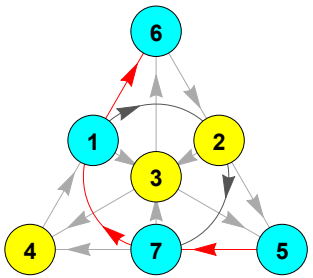
split=2

Fano plane



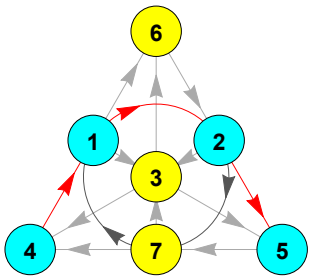
split=4

Fano plane



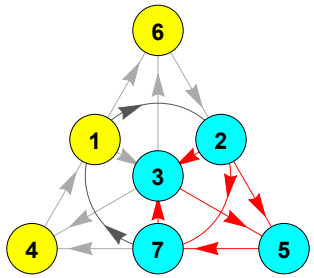
split=6

Fano plane



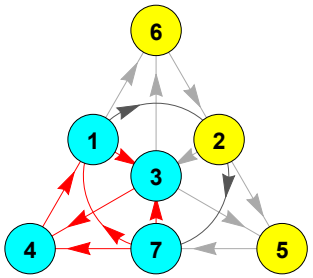
split=3

Fano plane



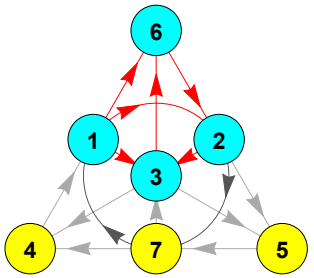
split=5

Fano plane



split=7

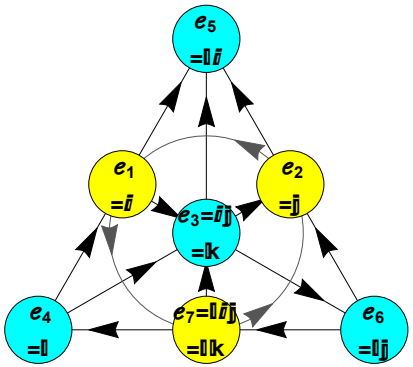
Fano plane



flip=True

{1, 7, 2}{1, 3, 6}{1, 5, 4}{2, 4, 3}{2, 5, 6}{3, 5, 7}{4, 6, 7}

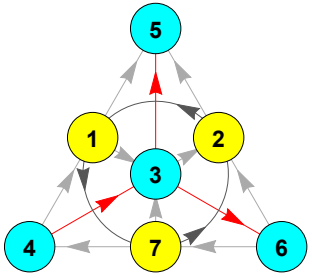
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	e_6	$-e_5$	e_4	$-e_3$	e_2
e_2	e_2	e_7	−1	$-e_4$	e_3	e_6	$-e_5$	$-e_1$
e_3	e_3	$-e_6$	e_4	−1	$-e_2$	e_7	e_1	$-e_5$
e_4	e_4	e_5	$-e_3$	e_2	−1	$-e_1$	e_7	$-e_6$
e_5	e_5	$-e_4$	$-e_6$	$-e_7$	e_1	−1	e_2	e_3
e_6	e_6	e_3	e_5	$-e_1$	$-e_7$	$-e_2$	−1	e_4
e_7	e_7	$-e_2$	e_1	e_5	e_6	$-e_3$	$-e_4$	−1

split=1

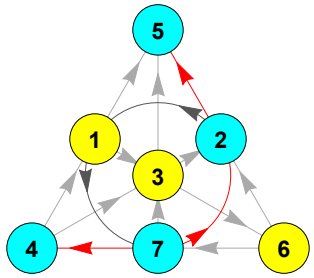
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	6	−5	4	−3	2
2	7	−1	−4	3	6	−5	−1
3	−6	4	1	2	−7	−1	−5
4	5	−3	−2	1	1	−7	−6
5	−4	−6	7	−1	1	−2	3
6	3	5	1	7	2	1	4
7	−2	1	5	6	−3	−4	−1

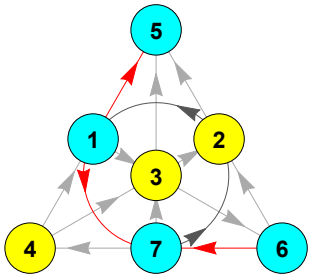
split=2

Fano plane



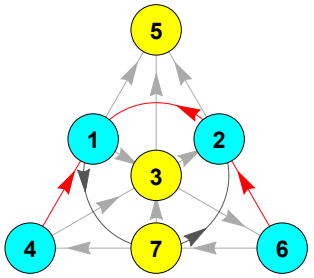
split=4

Fano plane



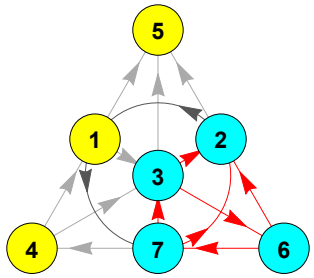
split=6

Fano plane



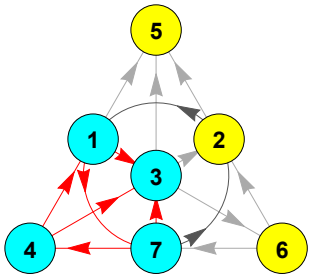
split=3

Fano plane



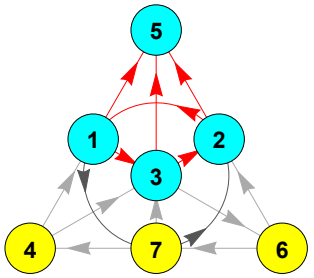
split=5

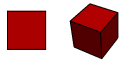
Fano plane



split=7

Fano plane

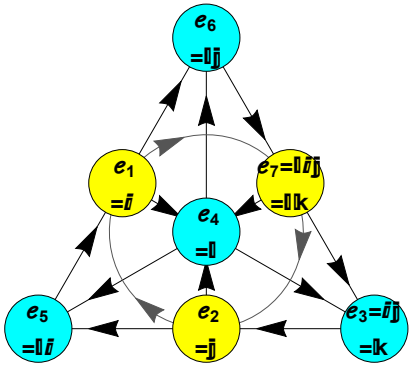


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
147	$t_{r_d}^{0\to 2/3}$		0apggsscc 001110001_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Th}}$ 90

flip=False

{1, 7, 2}{1, 4, 3}{1, 6, 5}{2, 5, 3}{2, 4, 6}{3, 6, 7}{4, 5, 7}

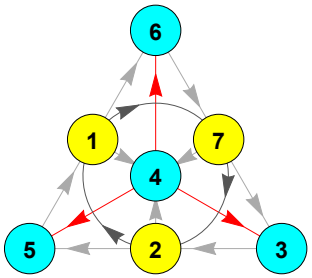
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	$-e_4$	e_3	$-e_6$	e_5	e_2
e_2	e_2	e_7	−1	$-e_5$	e_6	e_3	$-e_4$	$-e_1$
e_3	e_3	e_4	e_5	−1	$-e_1$	$-e_2$	e_7	$-e_6$
e_4	e_4	$-e_3$	$-e_6$	e_1	−1	e_7	e_2	$-e_5$
e_5	e_5	e_6	$-e_3$	e_2	$-e_7$	−1	$-e_1$	e_4
e_6	e_6	$-e_5$	e_4	$-e_7$	$-e_2$	e_1	−1	e_3
e_7	e_7	$-e_2$	e_1	e_6	e_5	$-e_4$	$-e_3$	−1

split=1

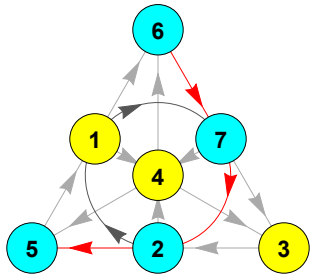
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−4	3	−6	5	2
2	7	−1	−5	6	3	−4	−1
3	4	5	1	1	2	−7	−6
4	−3	−6	−1	1	−7	−2	−5
5	6	−3	−2	7	1	1	4
6	−5	4	7	2	−1	1	3
7	−2	1	6	5	−4	−3	−1

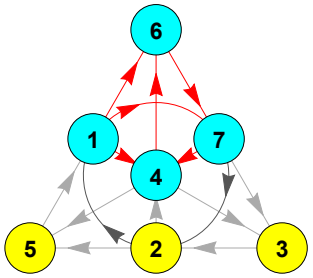
split=2

Fano plane



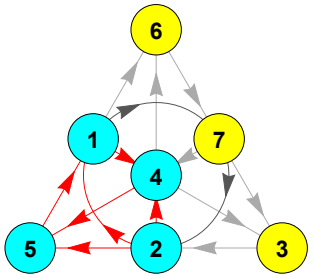
split=4

Fano plane



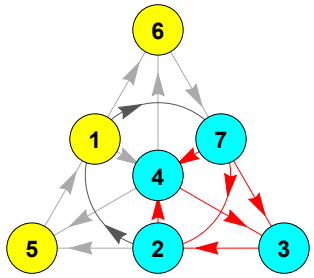
split=6

Fano plane



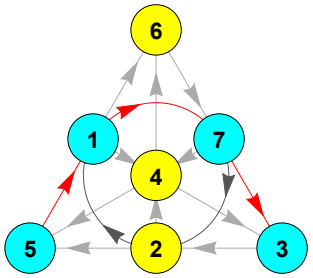
split=3

Fano plane



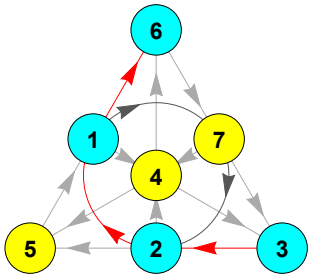
split=5

Fano plane



split=7

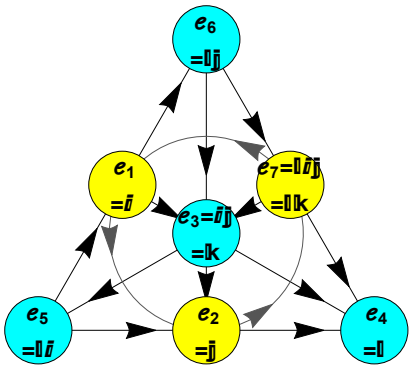
Fano plane



flip=True

{1, 2, 7}{1, 3, 4}{1, 6, 5}{2, 6, 3}{2, 4, 5}{3, 5, 7}{4, 6, 7}

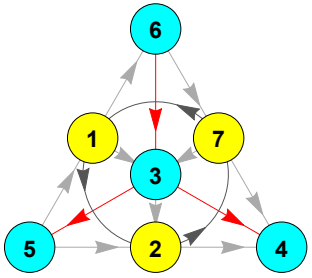
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	e_4	$-e_3$	$-e_6$	e_5	$-e_2$
e_2	e_2	$-e_7$	−1	$-e_6$	e_5	$-e_4$	e_3	e_1
e_3	e_3	$-e_4$	e_6	−1	e_1	e_7	$-e_2$	$-e_5$
e_4	e_4	e_3	$-e_5$	$-e_1$	−1	e_2	e_7	$-e_6$
e_5	e_5	e_6	e_4	$-e_7$	$-e_2$	−1	$-e_1$	e_3
e_6	e_6	$-e_5$	$-e_3$	e_2	$-e_7$	e_1	−1	e_4
e_7	e_7	e_2	$-e_1$	e_5	e_6	$-e_3$	$-e_4$	−1

split=1

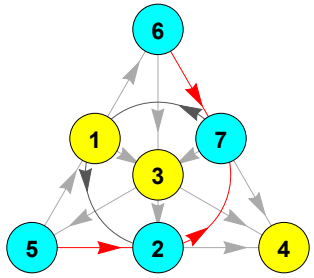
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	4	−3	−6	5	−2
2	−7	−1	−6	5	−4	3	1
3	−4	6	1	−1	−7	2	−5
4	3	−5	1	1	−2	−7	−6
5	6	4	7	2	1	1	3
6	−5	−3	−2	7	−1	1	4
7	2	−1	5	6	−3	−4	−1

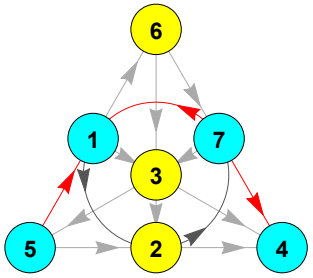
split=2

Fano plane



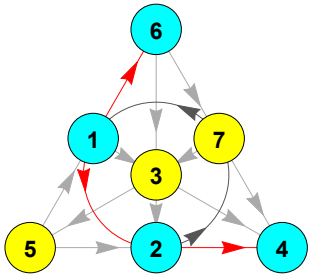
split=4

Fano plane



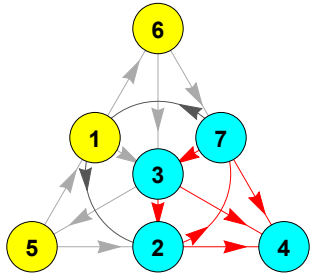
split=6

Fano plane



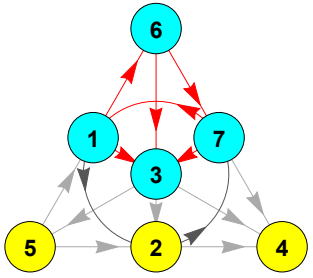
split=3

Fano plane



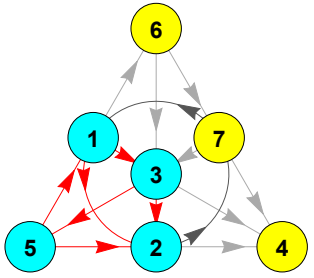
split=5

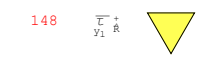
Fano plane



split=7

Fano plane

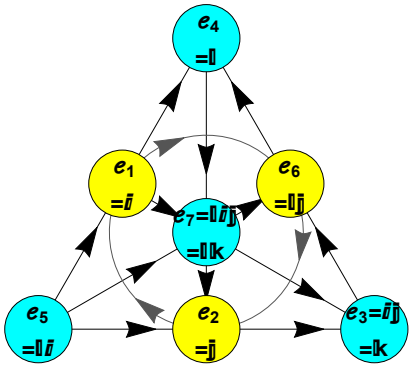


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits										Binary / E8 Coordinates	Ele #
148	$\overline{\underset{y_1}{\overset{c}{\Gamma}}}^{+}_{\hat{R}}$		0apggsscc 010110100_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Pu}}$ 94

flip=False

{1, 6, 2}{1, 7, 3}{1, 4, 5}{2, 3, 5}{2, 4, 7}{3, 6, 4}{5, 7, 6}

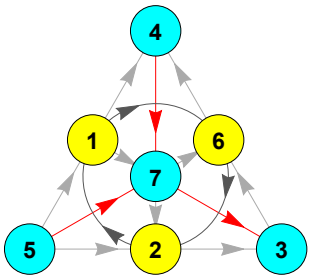
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	$-e_7$	e_5	$-e_4$	e_2	e_3
e_2	e_6	$-e_1$	−1	e_5	e_7	$-e_3$	$-e_1$	$-e_4$
e_3	e_7	$-e_5$	e_1	−1	$-e_6$	e_2	e_4	$-e_1$
e_4	$-e_5$	$-e_7$	e_6	e_1	−1	e_3	$-e_2$	e_5
e_5	e_4	e_3	$-e_2$	$-e_1$	e_3	−1	$-e_7$	e_6
e_6	$-e_2$	e_1	$-e_4$	e_3	e_7	e_1	−1	$-e_5$
e_7	$-e_3$	e_4	e_1	$-e_2$	$-e_6$	e_5	e_1	−1

split=1

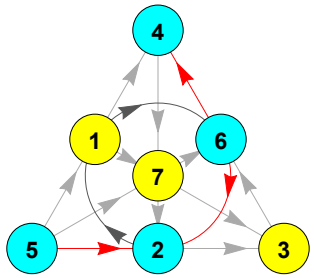
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−7	5	−4	2	3
2	6	−1	5	7	−3	−1	−4
3	7	−5	1	6	−2	4	1
4	−5	−7	−6	1	−1	−3	−2
5	4	3	2	1	1	−7	−6
6	−2	1	−4	3	7	−1	−5
7	−3	4	−1	2	6	5	1

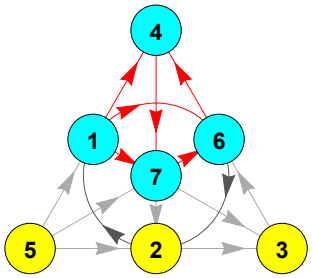
split=2

Fano plane



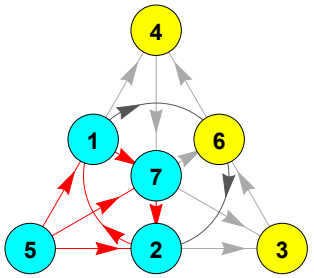
split=4

Fano plane



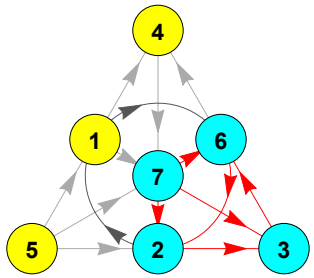
split=6

Fano plane



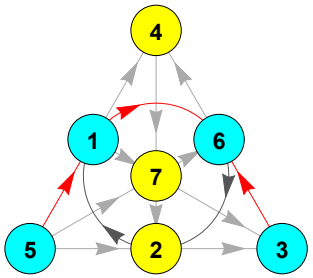
split=3

Fano plane



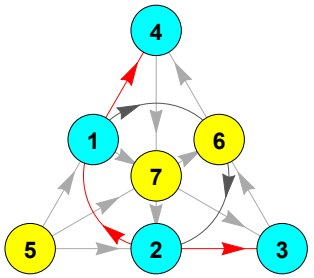
split=5

Fano plane



split=7

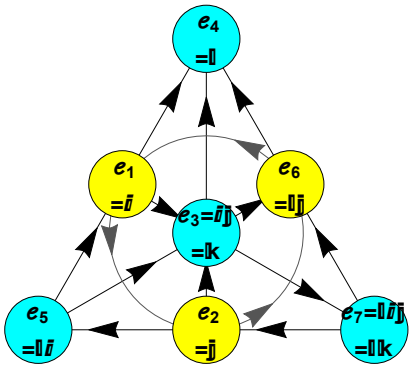
Fano plane



flip=True

{1, 2, 6}{1, 3, 7}{1, 4, 5}{2, 3, 4}{2, 5, 7}{3, 6, 5}{4, 7, 6}

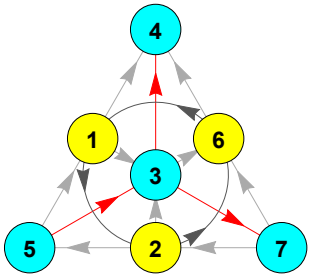
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_7	e_5	$-e_4$	$-e_2$	$-e_3$
e_2	$-e_6$	−1	e_4	$-e_3$	e_7	e_1	$-e_5$	
e_3	$-e_7$	$-e_4$	−1	e_2	$-e_6$	e_5	e_1	
e_4	$-e_5$	e_3	$-e_2$	−1	e_1	$-e_7$	e_6	
e_5	e_4	$-e_7$	e_6	$-e_1$	−1	$-e_3$	e_2	
e_6	e_2	$-e_1$	$-e_5$	e_7	e_3	−1	$-e_4$	
e_7	e_3	e_5	$-e_1$	$-e_6$	$-e_2$	e_4	−1	

split=1

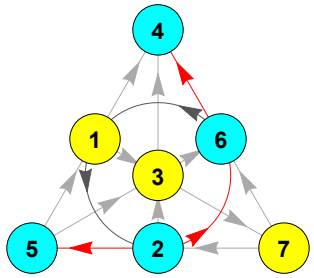
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	7	5	−4	−2	−3
2	−6	−1	4	−3	7	1	−5
3	−7	−4	1	−2	6	5	−1
4	−5	3	2	1	−1	−7	−6
5	4	−7	−6	1	1	−3	−2
6	2	−1	−5	7	3	−1	−4
7	3	5	1	6	2	4	1

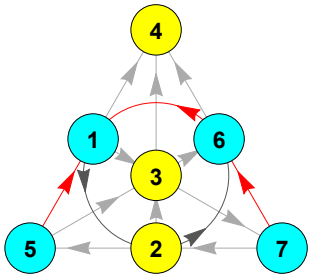
split=2

Fano plane



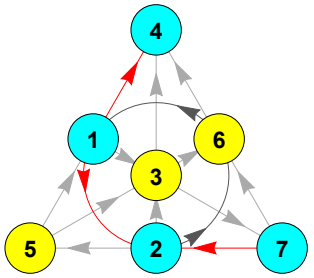
split=4

Fano plane



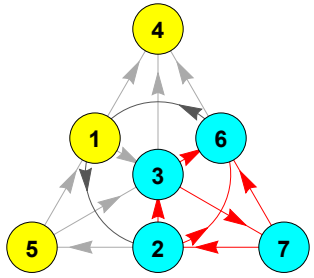
split=6

Fano plane



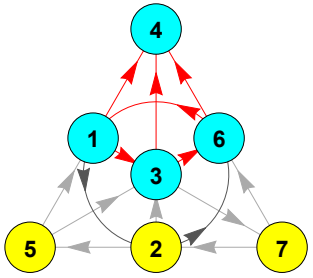
split=3

Fano plane



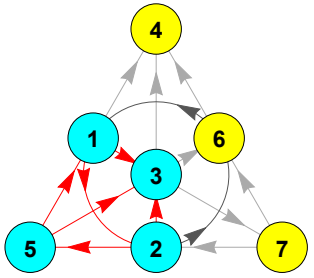
split=5

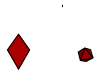
Fano plane



split=7

Fano plane

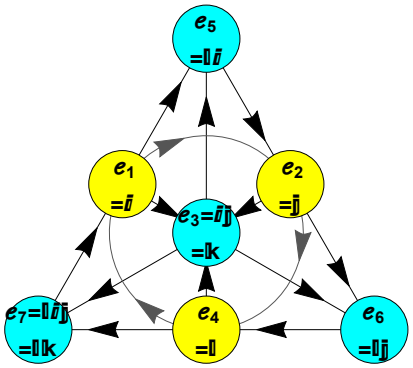


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
149	$\bar{u}^{0\to-2/3}_{r_d\ L}$		0apggsscc 0110100001_2	Bn{ E8{	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Tm 69

flip=False

{1, 2, 4}{1, 3, 6}{1, 5, 7}{2, 3, 7}{2, 6, 5}{3, 5, 4}{4, 7, 6}

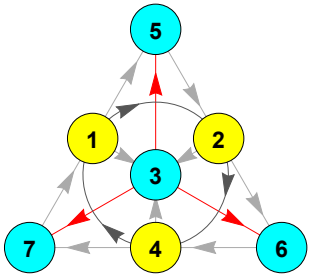
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	e_6	$-e_2$	e_7	$-e_3$	$-e_5$
e_2	e_2	$-e_4$	−1	e_7	e_1	$-e_6$	e_5	$-e_3$
e_3	e_3	$-e_6$	$-e_7$	−1	$-e_5$	e_4	e_1	e_2
e_4	e_4	e_2	$-e_1$	e_5	−1	$-e_3$	$-e_7$	e_6
e_5	e_5	$-e_7$	e_6	$-e_4$	e_3	−1	$-e_2$	e_1
e_6	e_6	e_3	$-e_5$	$-e_1$	e_7	e_2	−1	$-e_4$
e_7	e_7	e_5	e_3	$-e_2$	$-e_6$	$-e_1$	e_4	−1

split=1

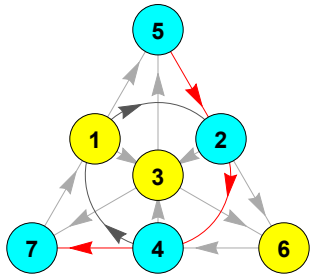
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	6	−2	7	−3	−5
2	−4	−1	7	1	−6	5	−3
3	−6	−7	1	−5	−4	−1	−2
4	2	−1	5	−1	−3	−7	6
5	−7	6	4	3	1	2	−1
6	3	−5	1	7	−2	1	4
7	5	3	2	−6	1	−4	1

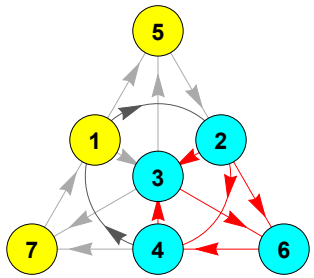
split=2

Fano plane



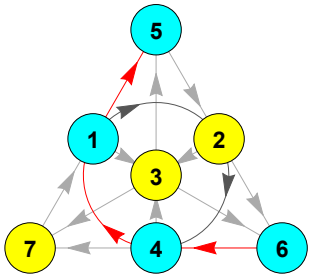
split=3

Fano plane



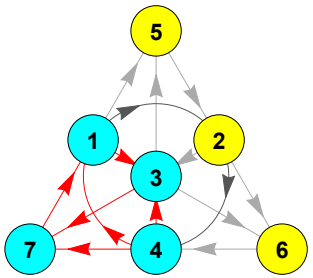
split=4

Fano plane



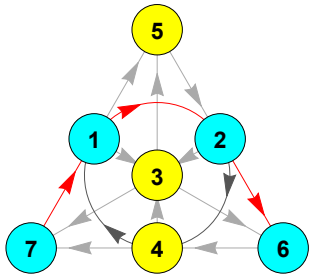
split=5

Fano plane



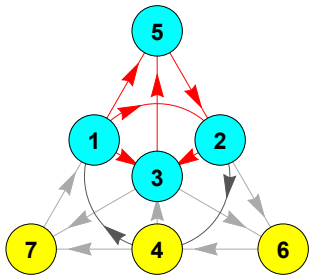
split=6

Fano plane



split=7

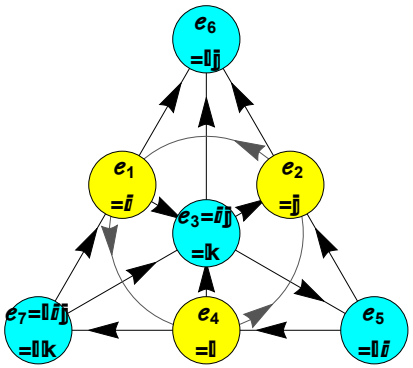
Fano plane



flip=True

{1, 4, 2}{1, 3, 5}{1, 6, 7}{2, 7, 3}{2, 6, 5}{3, 6, 4}{4, 7, 5}

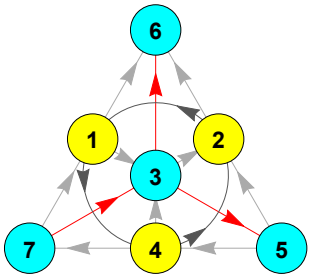
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_4$	e_5	e_2	$-e_3$	e_7	$-e_6$
e_2	e_2	e_4	−1	$-e_7$	$-e_1$	$-e_6$	e_5	e_3
e_3	e_3	$-e_5$	e_7	−1	$-e_6$	e_1	e_4	$-e_2$
e_4	e_4	$-e_2$	e_1	e_6	−1	$-e_7$	$-e_3$	e_5
e_5	e_5	e_3	e_6	$-e_1$	e_7	−1	$-e_2$	$-e_4$
e_6	e_6	$-e_7$	$-e_5$	$-e_4$	e_3	e_2	−1	e_1
e_7	e_7	e_6	$-e_3$	e_2	$-e_5$	e_4	$-e_1$	−1

split=1

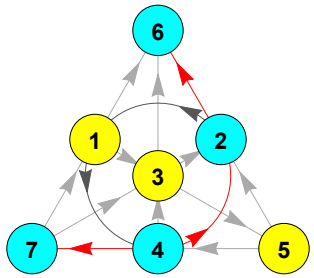
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	5	2	−3	7	−6
2	4	−1	−7	−1	−6	5	3
3	−5	7	1	−6	−1	−4	2
4	−2	1	6	−1	−7	−3	5
5	3	6	1	7	1	2	4
6	−7	−5	4	3	−2	1	−1
7	6	−3	−2	−5	−4	1	1

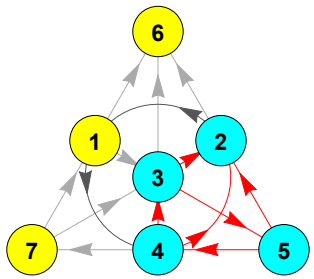
split=2

Fano plane



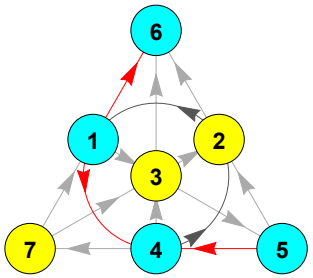
split=3

Fano plane



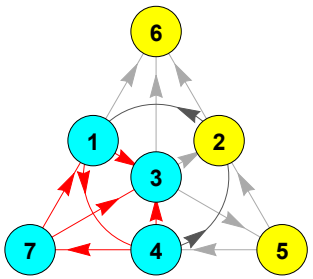
split=4

Fano plane



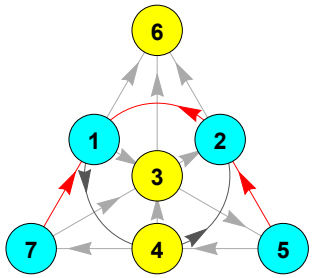
split=5

Fano plane



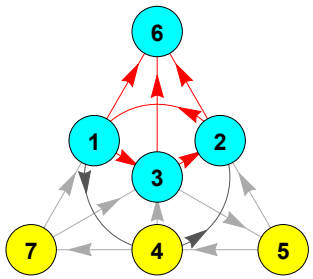
split=6

Fano plane



split=7

Fano plane

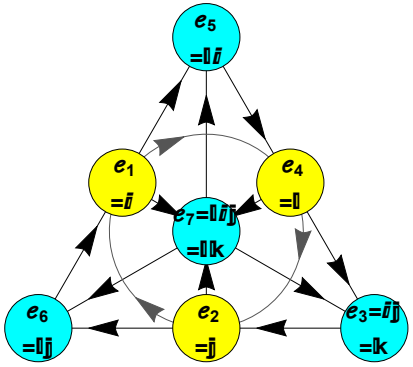


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
150	$\overline{u}_{g_d}^{0\to -2/3}$		0apggsscc 0110100101_2	Bn{ E8{	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Eu 63

flip=False

{1, 4, 2}{1, 7, 3}{1, 5, 6}{2, 6, 3}{2, 7, 5}{3, 5, 4}{4, 7, 6}

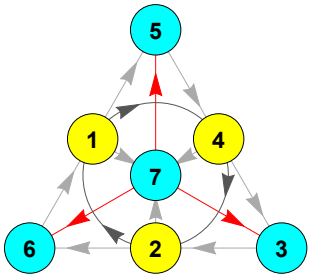
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_7$	e_2	e_6	$-e_5$	e_3
e_2	e_4	−1	$-e_6$	$-e_1$	$-e_7$	e_3	e_5
e_3	e_7	e_6	−1	$-e_5$	e_4	$-e_2$	$-e_1$
e_4	$-e_2$	e_1	e_5	−1	$-e_3$	$-e_7$	e_6
e_5	$-e_6$	e_7	$-e_4$	e_3	−1	e_1	$-e_2$
e_6	e_5	$-e_3$	e_2	e_7	$-e_1$	−1	$-e_4$
e_7	$-e_3$	$-e_5$	e_1	$-e_6$	e_2	e_4	−1

split=1

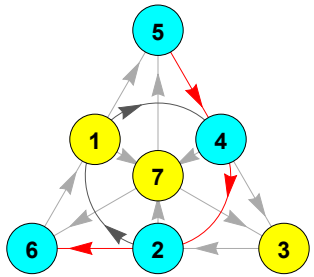
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−7	2	6	−5	3
2	4	−1	−6	−1	−7	3	5
3	7	6	1	−5	−4	2	1
4	−2	1	5	−1	−3	−7	6
5	−6	7	4	3	1	−1	2
6	5	−3	−2	7	1	1	4
7	−3	−5	−1	−6	−2	−4	1

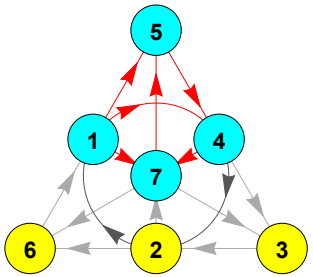
split=2

Fano plane



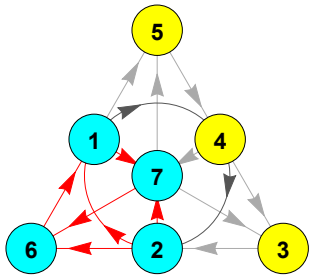
split=4

Fano plane



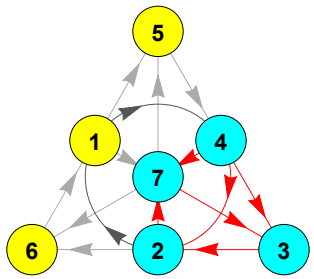
split=6

Fano plane



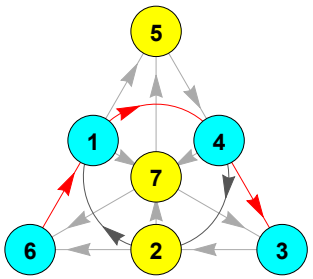
split=3

Fano plane



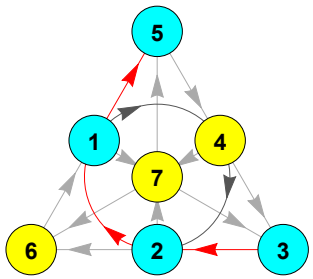
split=5

Fano plane



split=7

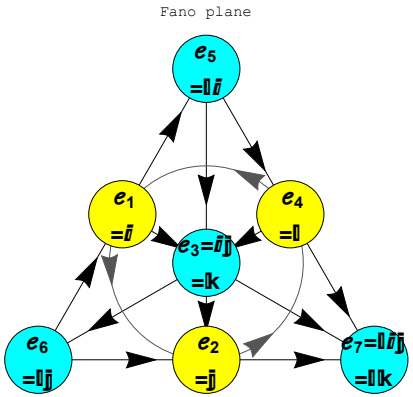
Fano plane



flip=True

{1, 2, 4}{1, 3, 7}{1, 5, 6}{2, 5, 3}{2, 7, 6}{3, 6, 4}{4, 7, 5}

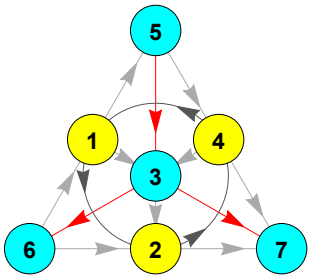
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	e_7	$-e_2$	e_6	$-e_5$	$-e_3$
e_2	$-e_4$	−1	$-e_5$	e_1	e_3	$-e_7$	e_6
e_3	$-e_7$	e_5	−1	$-e_6$	$-e_2$	e_4	e_1
e_4	e_2	$-e_1$	e_6	−1	$-e_7$	$-e_3$	e_5
e_5	$-e_6$	$-e_3$	e_2	e_7	−1	e_1	$-e_4$
e_6	e_5	e_7	$-e_4$	e_3	$-e_1$	−1	$-e_2$
e_7	e_3	$-e_6$	$-e_1$	$-e_5$	e_4	e_2	−1

split=1

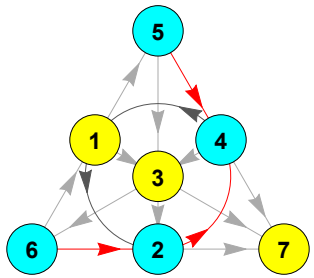
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	7	−2	6	−5	−3
2	−4	−1	−5	1	3	−7	6
3	−7	5	1	−6	2	−4	−1
4	2	−1	6	−1	−7	−3	5
5	−6	−3	−2	7	1	−1	4
6	5	7	4	3	1	1	2
7	3	−6	1	−5	−4	−2	1

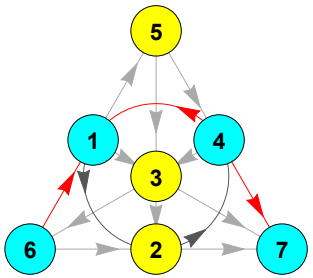
split=2

Fano plane



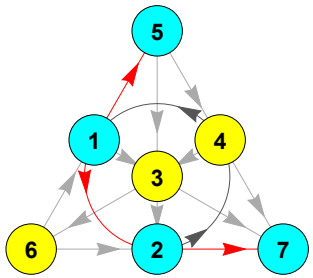
split=4

Fano plane



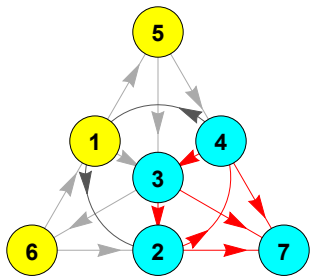
split=6

Fano plane



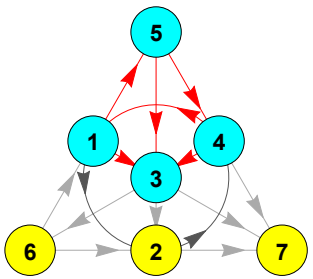
split=3

Fano plane



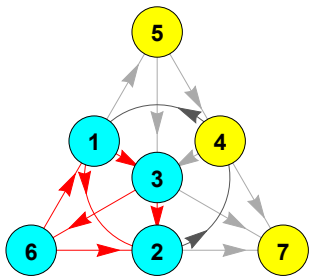
split=5

Fano plane



split=7

Fano plane

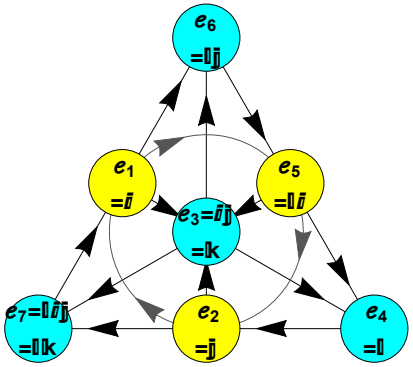


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
151	$\overline{u}_{b_d}{}^{-2/3}$		0apggsscc 011010011$_2$	Bn{ 0 0 1 1 1 0 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{Po}}$ 84

flip=False

{1, 5, 2}{1, 3, 4}{1, 6, 7}{2, 3, 6}{2, 7, 4}{3, 7, 5}{4, 6, 5}

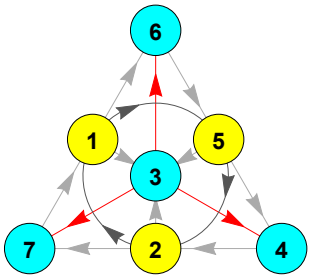
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_5$	e_4	$-e_3$	e_2	e_7	$-e_6$
e_2	e_5	$-e_5$	−1	e_6	$-e_7$	$-e_1$	$-e_3$	e_4
e_3	$-e_4$	$-e_6$	$-e_1$	−1	$-e_7$	e_2	e_5	
e_4	e_3	e_7	$-e_1$	$-e_7$	−1	$-e_6$	e_5	$-e_2$
e_5	$-e_2$	e_1	e_7	e_6	$-e_6$	−1	$-e_4$	$-e_3$
e_6	$-e_7$	e_3	$-e_2$	$-e_5$	e_4	$-e_4$	−1	e_1
e_7	e_6	$-e_4$	$-e_5$	e_2	e_3	$-e_3$	$-e_1$	−1

split=1

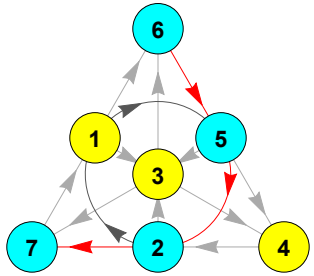
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	4	−3	2	7	−6
2	5	−1	6	−7	−1	−3	4
3	−4	−6	1	−1	−7	−2	−5
4	3	7	1	1	−6	−5	2
5	−2	1	7	6	−1	−4	−3
6	−7	3	2	5	4	1	−1
7	6	−4	5	−2	3	1	1

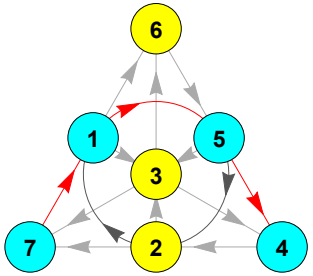
split=2

Fano plane



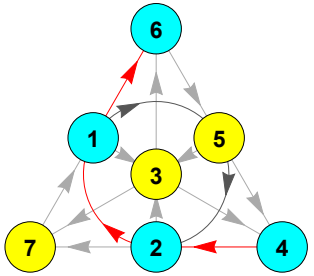
split=4

Fano plane



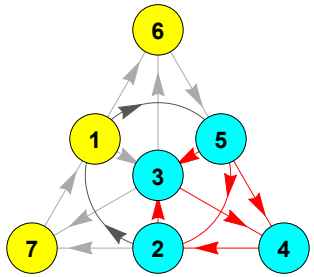
split=6

Fano plane



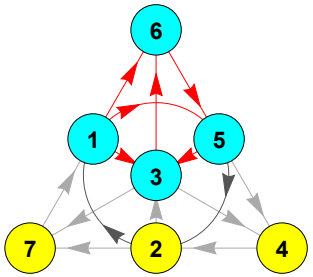
split=3

Fano plane



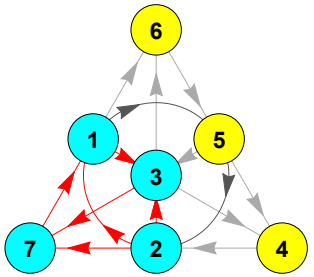
split=5

Fano plane



split=7

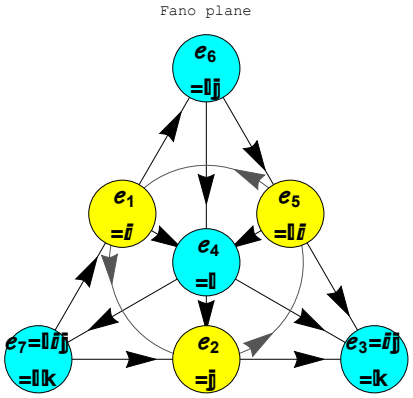
Fano plane



flip=True

{1, 2, 5}{1, 4, 3}{1, 6, 7}{2, 3, 7}{2, 6, 4}{3, 6, 5}{4, 7, 5}

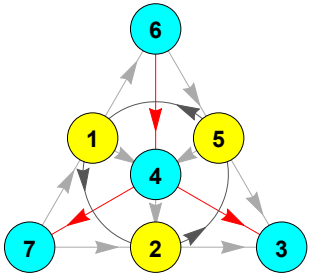
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	$-e_4$	e_3	$-e_2$	e_7	$-e_6$
e_2	$-e_5$	−1	e_7	$-e_6$	e_1	e_4	$-e_3$	
e_3	e_4	$-e_7$	−1	$-e_1$	$-e_6$	e_5	e_2	
e_4	$-e_3$	e_6	e_1	−1	$-e_7$	$-e_2$	e_5	
e_5	e_2	$-e_1$	e_6	e_7	−1	$-e_3$	$-e_4$	
e_6	$-e_7$	$-e_4$	$-e_5$	e_2	e_3	−1	e_1	
e_7	e_6	e_3	$-e_2$	$-e_5$	e_4	$-e_1$	−1	

split=1

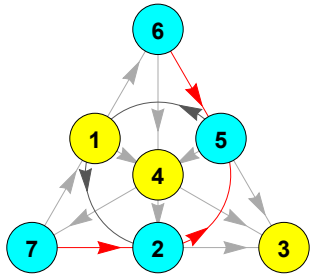
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−4	3	−2	7	−6
2	−5	−1	7	−6	1	4	−3
3	4	−7	1	1	−6	−5	−2
4	−3	6	−1	1	−7	2	−5
5	2	−1	6	7	−1	−3	−4
6	−7	−4	5	−2	3	1	−1
7	6	3	2	5	4	1	1

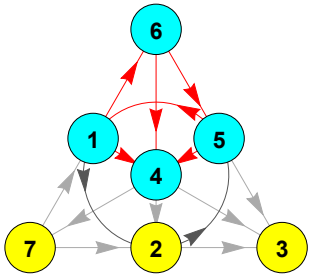
split=2

Fano plane



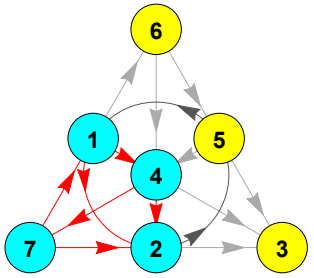
split=4

Fano plane



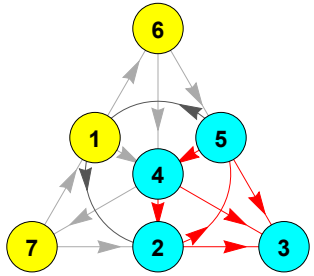
split=6

Fano plane



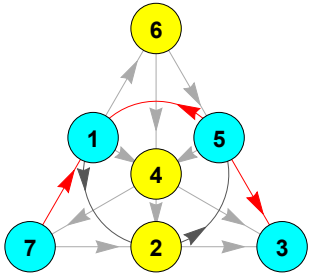
split=3

Fano plane



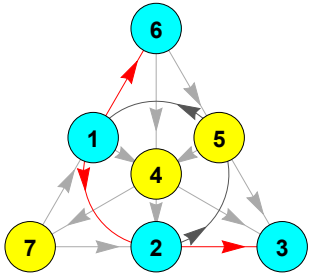
split=5

Fano plane



split=7

Fano plane

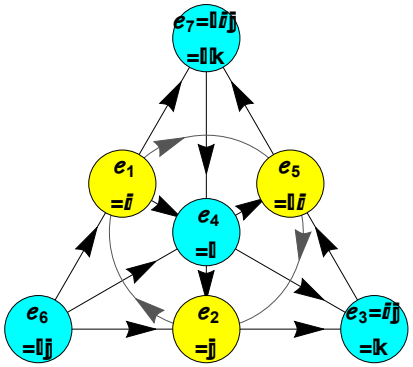


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
152	$d_{m_1}^{-1/3}$		0apggsscc 000010111_2	Bn{ E8{	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	La 57

flip=False

{1, 5, 2}{1, 4, 3}{1, 7, 6}{2, 3, 6}{2, 7, 4}{3, 5, 7}{4, 5, 6}

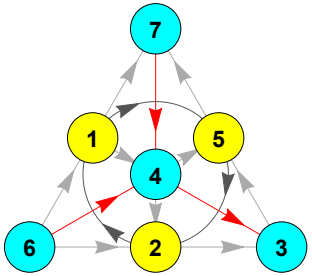
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_4$	e_3	e_2	$-e_7$	e_6
e_2	e_5	−1	e_6	$-e_7$	$-e_1$	$-e_3$	e_4
e_3	e_4	$-e_6$	−1	$-e_1$	e_7	e_2	$-e_5$
e_4	$-e_3$	e_7	e_1	−1	e_6	$-e_5$	$-e_2$
e_5	$-e_2$	e_1	$-e_7$	$-e_6$	−1	e_4	e_3
e_6	e_7	e_3	$-e_2$	e_5	$-e_4$	−1	$-e_1$
e_7	$-e_6$	$-e_4$	e_5	e_2	$-e_3$	e_1	−1

split=1

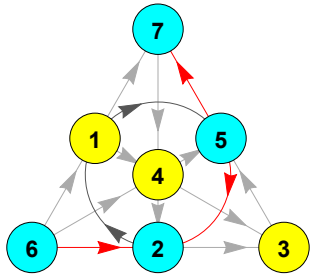
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−4	3	2	−7	6
2	5	−1	6	−7	−1	−3	4
3	4	−6	1	1	7	−2	5
4	−3	7	−1	1	6	5	2
5	−2	1	−7	−6	−1	4	3
6	7	3	2	−5	−4	1	1
7	−6	−4	−5	−2	−3	−1	1

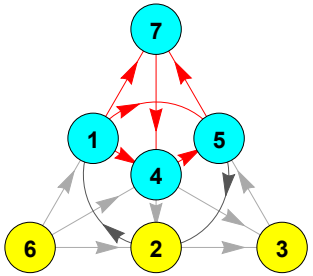
split=2

Fano plane



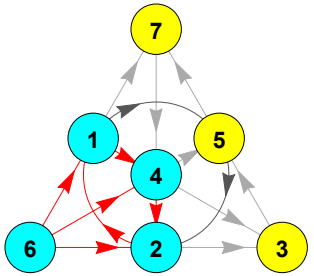
split=4

Fano plane



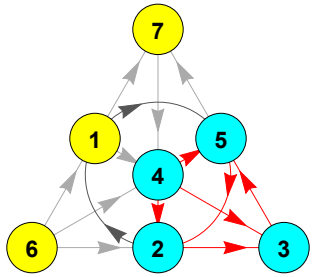
split=6

Fano plane



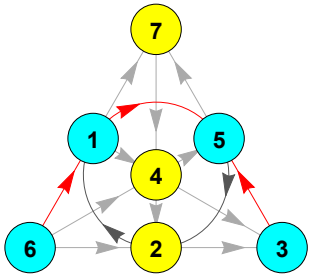
split=3

Fano plane



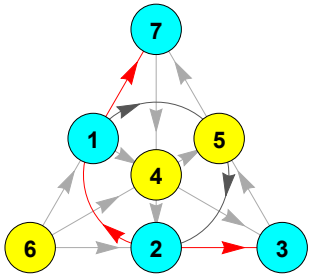
split=5

Fano plane



split=7

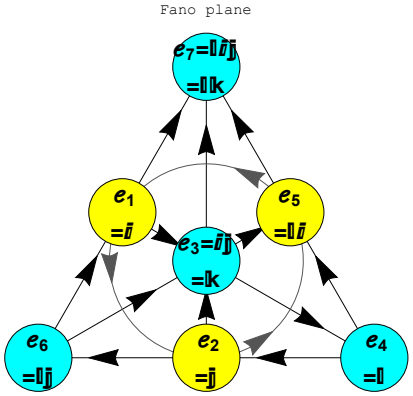
Fano plane



flip=True

{1, 2, 5}{1, 3, 4}{1, 7, 6}{2, 3, 7}{2, 6, 4}{3, 5, 6}{4, 5, 7}

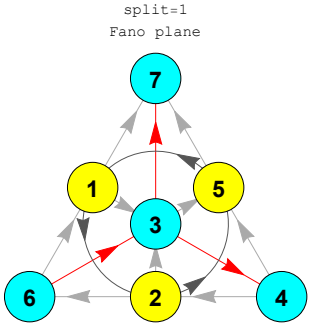
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_4	$-e_3$	$-e_2$	$-e_7$	e_6
e_2	$-e_5$	−1	e_7	$-e_6$	e_1	e_4	$-e_3$
e_3	$-e_4$	$-e_7$	−1	e_1	e_6	$-e_5$	e_2
e_4	e_3	e_6	$-e_1$	−1	e_7	$-e_2$	$-e_5$
e_5	e_2	$-e_1$	$-e_6$	$-e_7$	−1	e_3	e_4
e_6	e_7	$-e_4$	e_5	e_2	$-e_3$	−1	$-e_1$
e_7	$-e_6$	e_3	$-e_2$	e_5	$-e_4$	e_1	−1

split=1

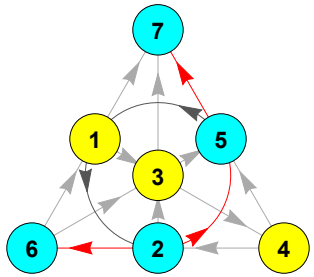
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	4	−3	−2	−7	6
2	−5	−1	7	−6	1	4	−3
3	−4	−7	1	−1	6	5	−2
4	3	6	1	1	7	2	5
5	2	−1	−6	−7	−1	3	4
6	7	−4	−5	−2	−3	1	1
7	−6	3	2	−5	−4	−1	1

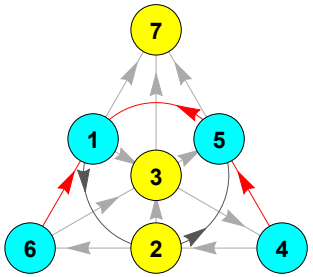
split=2

Fano plane



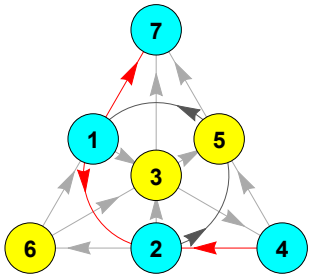
split=4

Fano plane



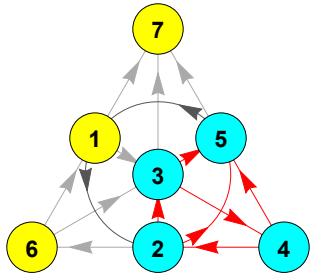
split=6

Fano plane



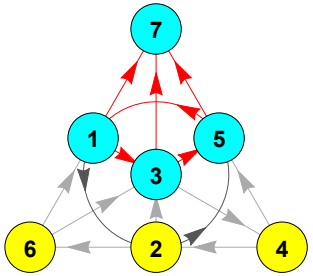
split=3

Fano plane



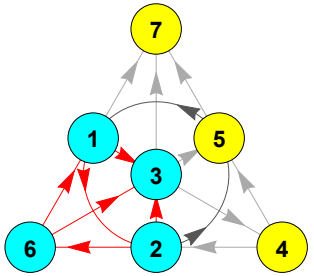
split=5

Fano plane



split=7

Fano plane

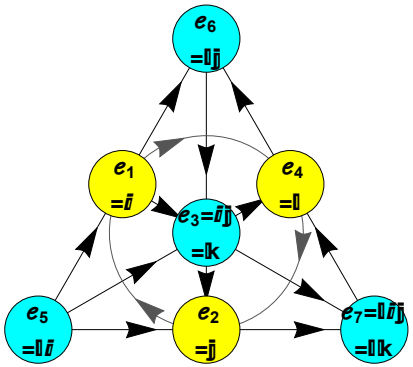


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
153	$d_{c_1}^{\hat{R}\to -1/3}$		0apggsscc 000010110_2	Bn{ 0 0 1 1 0 1 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\overline{Ra}}$ 88

flip=False

{1, 4, 2}{1, 3, 7}{1, 6, 5}{2, 6, 3}{2, 7, 5}{3, 4, 5}{4, 6, 7}

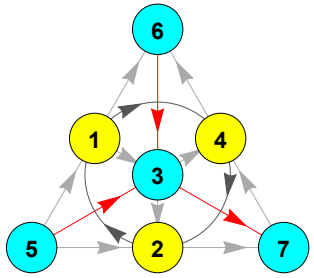
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_4$	e_7	e_2	$-e_6$	e_5	$-e_3$
e_2	e_4	$-e_1$	$-e_6$	$-e_1$	$-e_7$	e_3	e_5	
e_3	$-e_7$	e_6	−1	e_5	$-e_4$	$-e_2$	e_1	
e_4	$-e_2$	e_1	$-e_5$	−1	e_3	e_7	$-e_6$	
e_5	e_6	e_7	e_4	$-e_3$	−1	$-e_1$	$-e_2$	
e_6	$-e_5$	$-e_3$	e_2	$-e_7$	e_1	−1	e_4	
e_7	e_3	$-e_5$	$-e_1$	e_6	e_2	$-e_4$	−1	

split=1

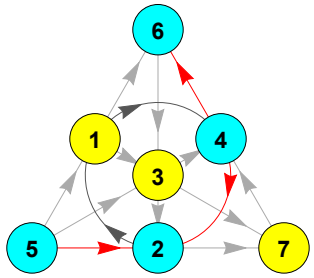
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	7	2	−6	5	−3
2	4	−1	−6	−1	−7	3	5
3	−7	6	1	5	4	2	−1
4	−2	1	−5	−1	3	7	−6
5	6	7	−4	−3	1	1	2
6	−5	−3	−2	−7	−1	1	−4
7	3	−5	1	6	−2	4	1

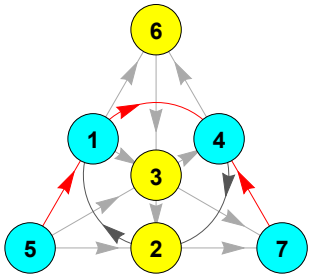
split=2

Fano plane



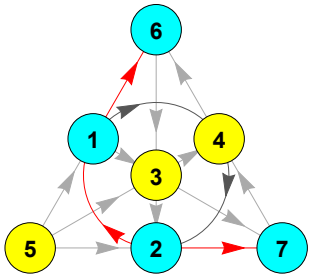
split=4

Fano plane



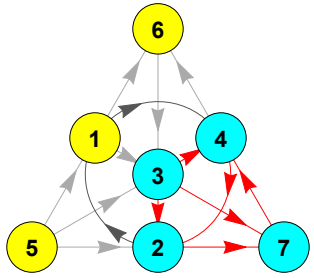
split=6

Fano plane



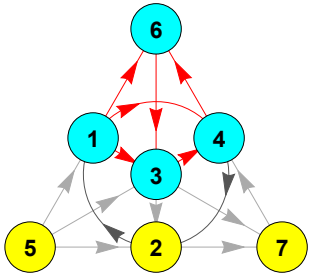
split=3

Fano plane



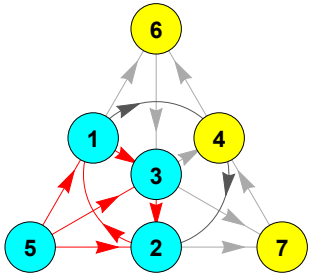
split=5

Fano plane



split=7

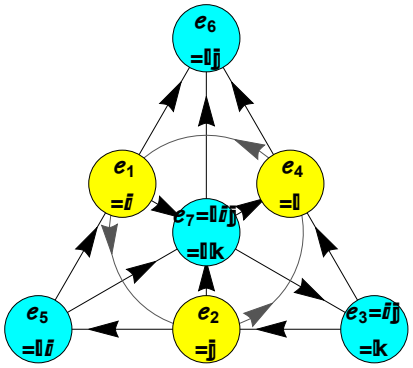
Fano plane



flip=True

{1, 2, 4}{1, 7, 3}{1, 6, 5}{2, 5, 3}{2, 7, 6}{3, 4, 6}{4, 5, 7}

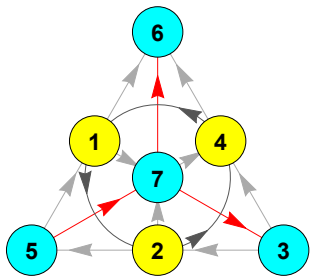
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	$-e_7$	$-e_2$	$-e_6$	e_5	e_3
e_2	$-e_4$	-1	$-e_5$	e_1	e_3	$-e_7$	e_6	
e_3	e_7	e_5	−1	e_6	$-e_2$	$-e_4$	$-e_1$	
e_4	e_2	$-e_1$	$-e_6$	−1	e_7	e_3	$-e_5$	
e_5	e_6	$-e_3$	e_2	$-e_7$	−1	$-e_1$	e_4	
e_6	$-e_5$	e_7	e_4	$-e_3$	e_1	−1	$-e_2$	
e_7	$-e_3$	$-e_6$	e_1	e_5	$-e_4$	e_2	−1	

split=1

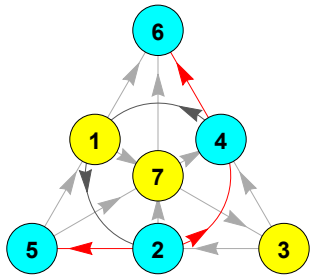
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−7	−2	−6	5	3
2	−4	−1	−5	1	3	−7	6
3	7	5	1	6	2	4	1
4	2	−1	−6	−1	7	3	−5
5	6	−3	−2	−7	1	1	−4
6	−5	7	−4	−3	−1	1	2
7	−3	−6	−1	5	4	−2	1

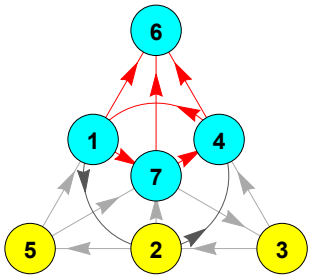
split=2

Fano plane



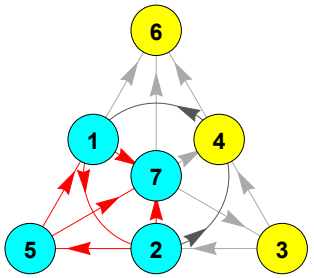
split=4

Fano plane



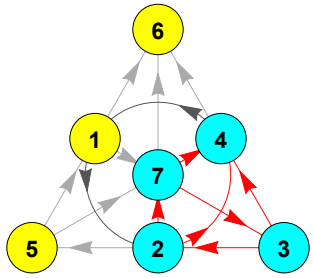
split=6

Fano plane



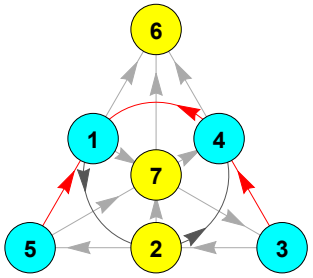
split=3

Fano plane



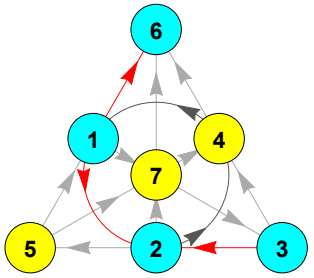
split=5

Fano plane



split=7

Fano plane

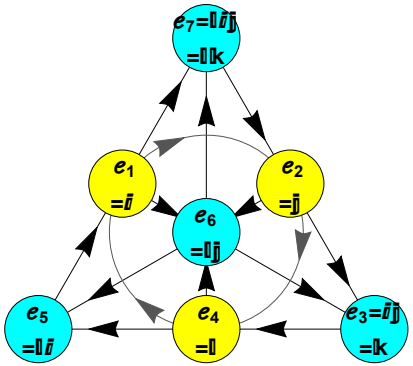


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
154	$d_{o_1}^{\overrightarrow{R}\to -1/3}$		0apggsscc 0000101012_2	Bn{ 0 0 1 1 0 0 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Pa}$ 91

flip=False

{1, 2, 4}{1, 6, 3}{1, 7, 5}{2, 3, 7}{2, 6, 5}{3, 4, 5}{4, 6, 7}

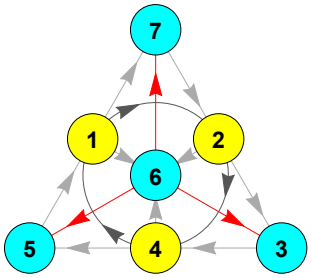
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_4	$-e_6$	$-e_2$	$-e_7$	e_3	e_5
e_2	$-e_4$	−1	e_7	e_1	$-e_6$	e_5	$-e_3$
e_3	e_6	$-e_7$	−1	e_5	$-e_4$	$-e_1$	e_2
e_4	e_2	$-e_1$	$-e_5$	−1	e_3	e_7	$-e_6$
e_5	e_7	e_6	e_4	$-e_3$	−1	$-e_2$	$-e_1$
e_6	$-e_3$	$-e_5$	e_1	$-e_7$	e_2	−1	e_4
e_7	$-e_5$	e_3	$-e_2$	e_6	e_1	$-e_4$	−1

split=1

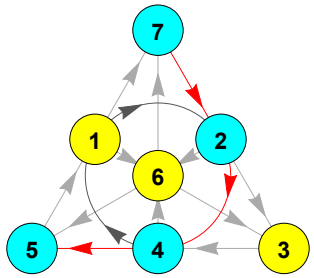
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−6	−2	−7	3	5
2	−4	−1	7	1	−6	5	−3
3	6	−7	1	5	4	1	−2
4	2	−1	−5	−1	3	7	−6
5	7	6	−4	−3	1	2	1
6	−3	−5	−1	−7	−2	1	−4
7	−5	3	2	6	−1	4	1

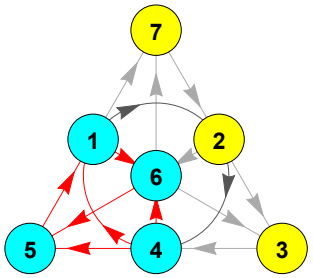
split=2

Fano plane



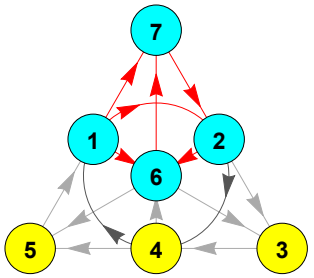
split=4

Fano plane



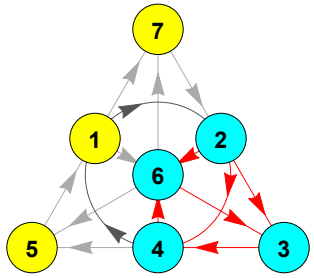
split=6

Fano plane



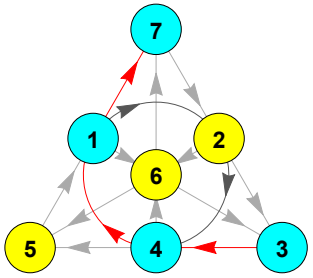
split=3

Fano plane



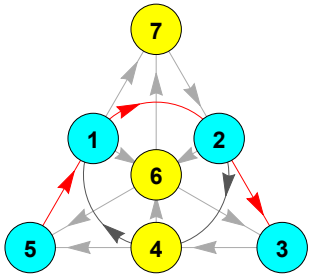
split=5

Fano plane



split=7

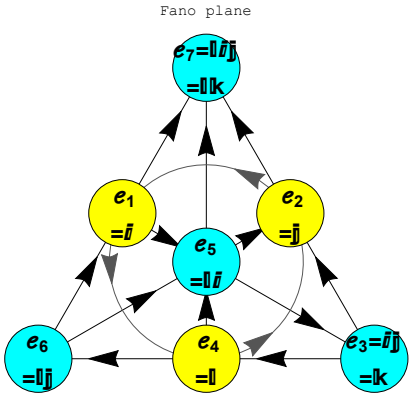
Fano plane



flip=True

{1, 4, 2}{1, 5, 3}{1, 7, 6}{2, 7, 3}{2, 6, 5}{3, 4, 6}{4, 5, 7}

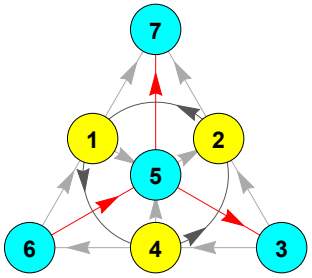
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_5$	e_2	e_3	$-e_7$	e_6
e_2	e_4	−1	$-e_7$	$-e_1$	$-e_6$	e_5	e_3
e_3	e_5	e_7	−1	e_6	$-e_1$	$-e_4$	$-e_2$
e_4	$-e_2$	e_1	$-e_6$	−1	e_7	e_3	$-e_5$
e_5	$-e_3$	e_6	e_1	$-e_7$	−1	$-e_2$	e_4
e_6	e_7	$-e_5$	e_4	$-e_3$	e_2	−1	$-e_1$
e_7	$-e_6$	$-e_3$	e_2	e_5	$-e_4$	e_1	−1

split=1

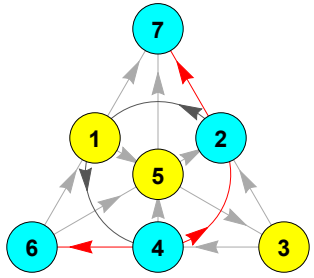
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−5	2	3	−7	6
2	4	−1	−7	−1	−6	5	3
3	5	7	1	6	1	4	2
4	−2	1	−6	−1	7	3	−5
5	−3	6	−1	−7	1	2	−4
6	7	−5	−4	−3	−2	1	1
7	−6	−3	−2	5	4	−1	1

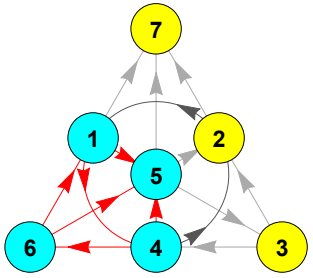
split=2

Fano plane



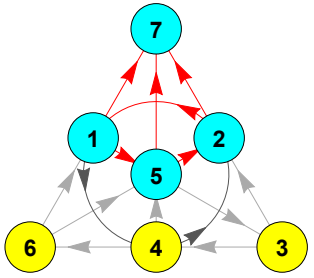
split=4

Fano plane



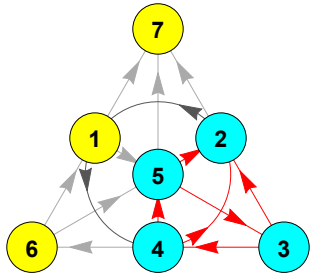
split=6

Fano plane



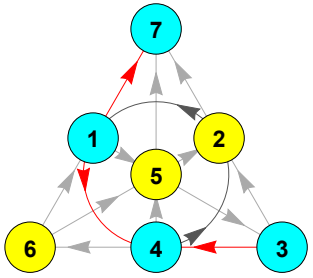
split=3

Fano plane



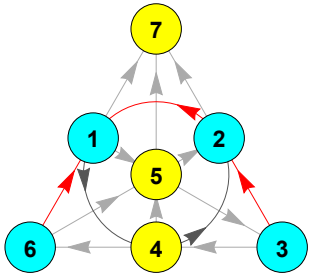
split=5

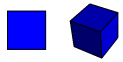
Fano plane



split=7

Fano plane

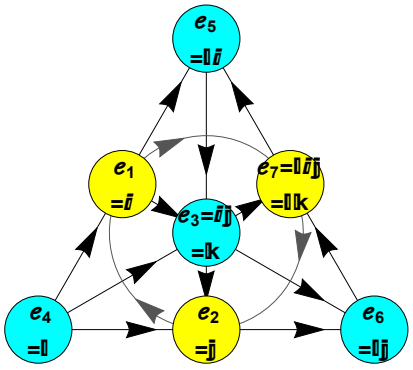


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
155	$t_{bm}^{2/3}$		0apggsscc 001111111_2	Bn{ E8{	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Sb 51

flip=False

{1, 7, 2}{1, 3, 6}{1, 5, 4}{2, 5, 3}{2, 6, 4}{3, 7, 4}{5, 6, 7}

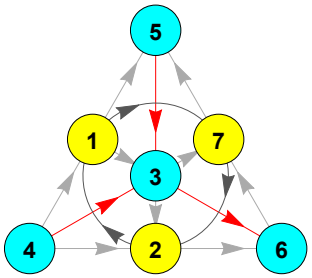
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_6	$-e_5$	e_4	$-e_3$	e_2
e_2	e_7	−1	$-e_5$	$-e_6$	e_3	e_4	$-e_1$
e_3	$-e_6$	e_5	−1	$-e_7$	$-e_2$	e_1	e_4
e_4	e_5	e_6	e_7	−1	$-e_1$	$-e_2$	$-e_3$
e_5	$-e_4$	$-e_3$	e_2	e_1	−1	e_7	$-e_6$
e_6	e_3	$-e_4$	$-e_1$	e_2	$-e_7$	−1	e_5
e_7	$-e_2$	e_1	$-e_4$	e_3	e_6	$-e_5$	−1

split=1

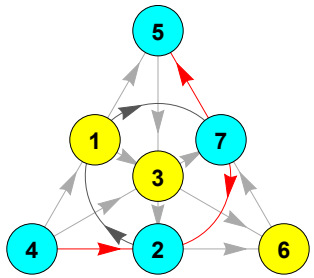
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	6	−5	4	−3	2
2	7	−1	−5	−6	3	4	−1
3	−6	5	1	7	2	−1	4
4	5	6	−7	1	1	2	−3
5	−4	−3	−2	−1	1	−7	−6
6	3	−4	1	−2	7	1	5
7	−2	1	−4	3	6	−5	−1

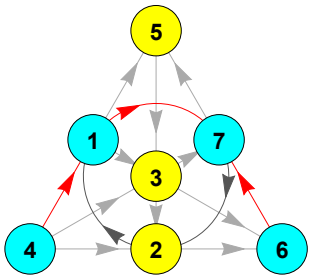
split=2

Fano plane



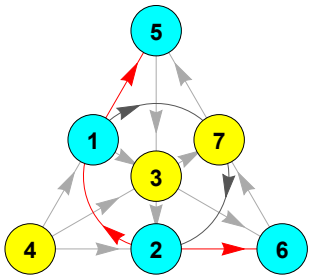
split=4

Fano plane



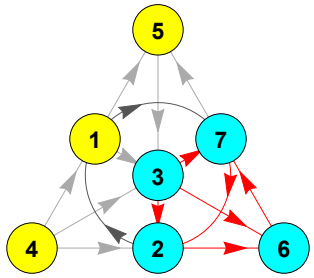
split=6

Fano plane



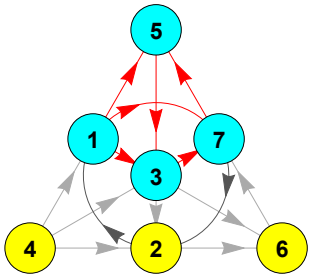
split=3

Fano plane



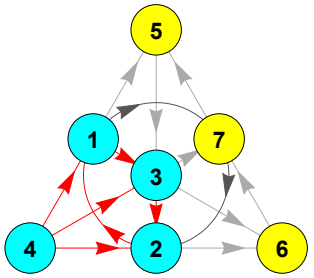
split=5

Fano plane



split=7

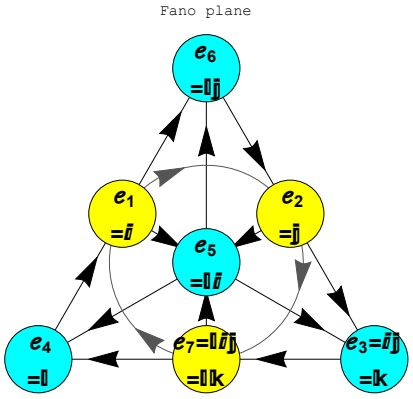
Fano plane



flip=True

{1, 2, 7}{1, 5, 3}{1, 6, 4}{2, 3, 6}{2, 5, 4}{3, 7, 4}{5, 6, 7}

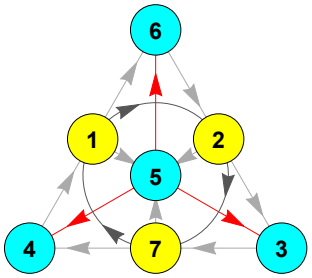
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_5$	$-e_6$	e_3	e_4	$-e_2$
e_2	$-e_7$	−1	e_6	$-e_5$	e_4	$-e_3$	e_1
e_3	e_5	$-e_6$	−1	$-e_7$	$-e_1$	e_2	e_4
e_4	e_6	e_5	e_7	−1	$-e_2$	$-e_1$	$-e_3$
e_5	$-e_3$	$-e_4$	e_1	e_2	−1	e_7	$-e_6$
e_6	$-e_4$	e_3	$-e_2$	e_1	$-e_7$	−1	e_5
e_7	e_2	$-e_1$	$-e_4$	e_3	e_6	$-e_5$	−1

split=1

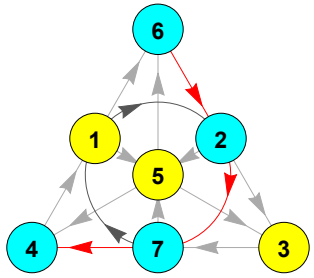
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−5	−6	3	4	−2
2	−7	−1	6	−5	4	−3	1
3	5	−6	1	7	1	−2	4
4	6	5	−7	1	2	1	−3
5	−3	−4	−1	−2	1	−7	−6
6	−4	3	2	−1	7	1	5
7	2	−1	−4	3	6	−5	−1

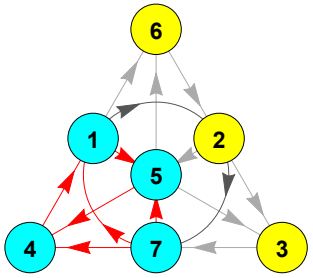
split=2

Fano plane



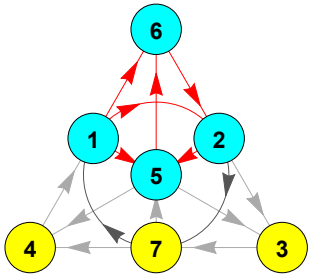
split=4

Fano plane



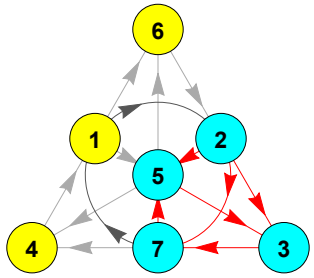
split=6

Fano plane



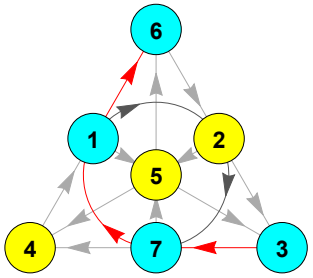
split=3

Fano plane



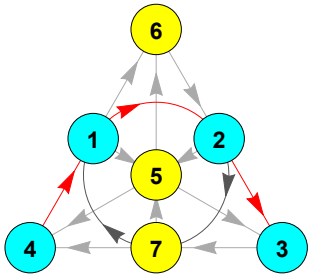
split=5

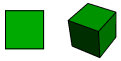
Fano plane



split=7

Fano plane

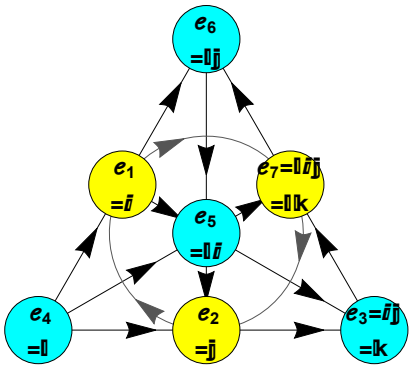


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
156	$t^{0\to 2/3}_{g_m\ k}$		0apggsscc 001111110_2	Bn{ 0 0 1 0 1 1 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{U}$ 92

flip=False

{1, 7, 2}{1, 5, 3}{1, 6, 4}{2, 3, 4}{2, 6, 5}{3, 7, 6}{4, 5, 7}

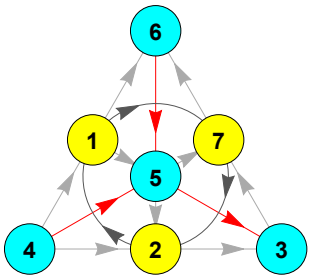
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_5$	$-e_6$	e_3	e_4	e_2
e_2	e_7	−1	e_4	$-e_3$	$-e_6$	e_5	$-e_1$
e_3	e_5	$-e_4$	−1	e_2	$-e_1$	$-e_7$	e_6
e_4	e_6	e_3	$-e_2$	−1	e_7	$-e_1$	$-e_5$
e_5	$-e_3$	e_6	e_1	$-e_7$	−1	$-e_2$	e_4
e_6	$-e_4$	$-e_5$	e_7	e_1	e_2	−1	$-e_3$
e_7	$-e_2$	e_1	$-e_6$	e_5	$-e_4$	e_3	−1

split=1

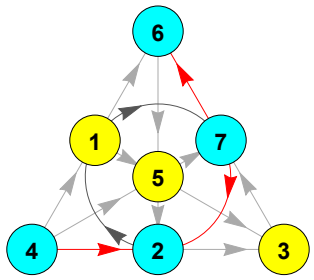
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−5	−6	3	4	2
2	7	−1	4	−3	−6	5	−1
3	5	−4	1	−2	1	7	6
4	6	3	2	1	−7	1	−5
5	−3	6	−1	7	1	2	4
6	−4	−5	−7	−1	−2	1	−3
7	−2	1	−6	5	−4	3	−1

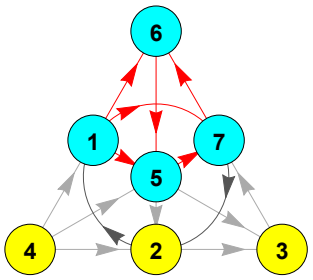
split=2

Fano plane



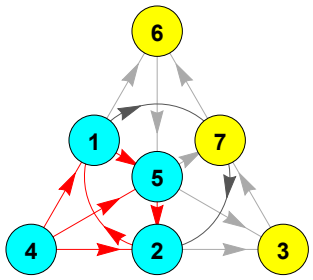
split=4

Fano plane



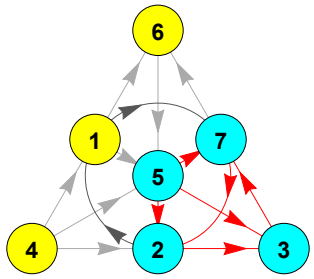
split=6

Fano plane



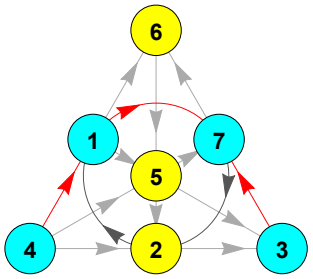
split=3

Fano plane



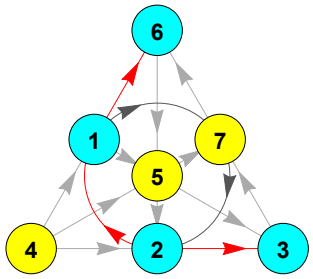
split=5

Fano plane



split=7

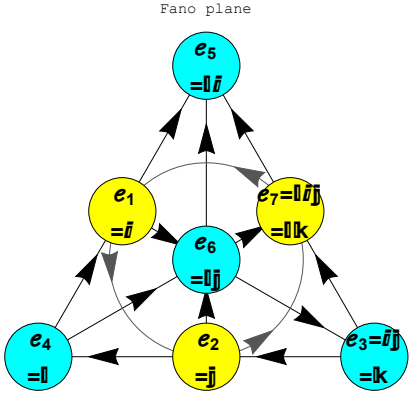
Fano plane



flip=True

{1, 2, 7}{1, 6, 3}{1, 5, 4}{2, 4, 3}{2, 6, 5}{3, 7, 5}{4, 6, 7}

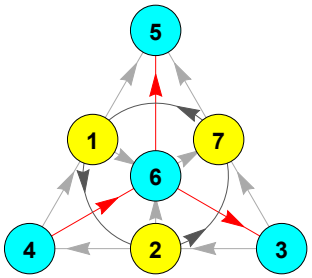
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_6$	$-e_5$	e_4	e_3	$-e_2$
e_2	$-e_7$	−1	$-e_4$	e_3	$-e_6$	e_5	e_1
e_3	e_6	e_4	−1	$-e_2$	$-e_7$	$-e_1$	e_5
e_4	e_5	$-e_3$	e_2	−1	$-e_1$	e_7	$-e_6$
e_5	$-e_4$	e_6	e_7	e_1	−1	$-e_2$	$-e_3$
e_6	$-e_3$	$-e_5$	e_1	$-e_7$	e_2	−1	e_4
e_7	e_2	$-e_1$	$-e_5$	e_6	e_3	$-e_4$	−1

split=1

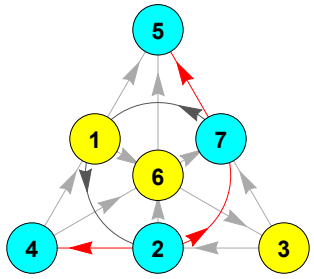
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−6	−5	4	3	−2
2	−7	−1	−4	3	−6	5	1
3	6	4	1	2	7	1	5
4	5	−3	−2	1	1	−7	−6
5	−4	6	−7	−1	1	2	−3
6	−3	−5	−1	7	−2	1	4
7	2	−1	−5	6	3	−4	−1

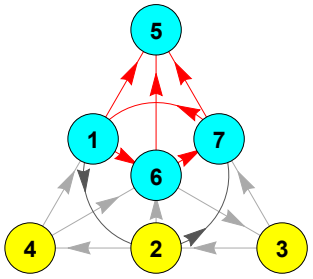
split=2

Fano plane



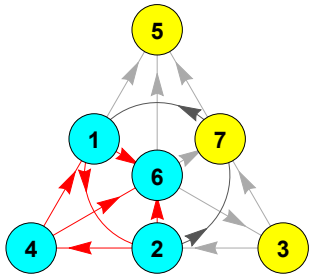
split=4

Fano plane



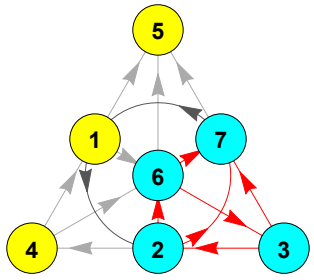
split=6

Fano plane



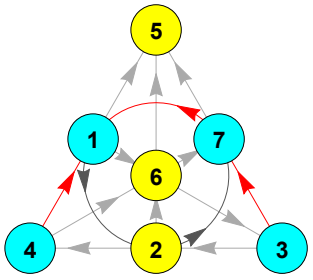
split=3

Fano plane



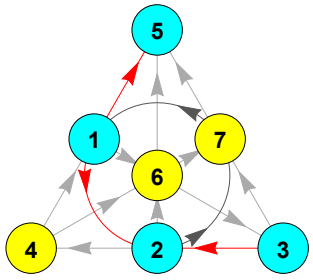
split=5

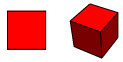
Fano plane



split=7

Fano plane

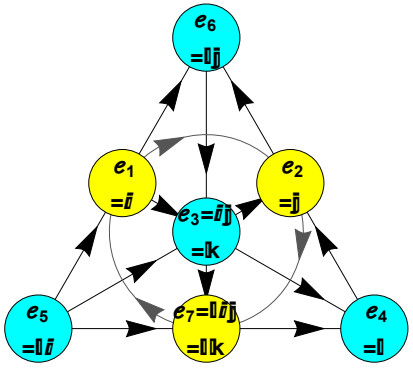


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
157	$t_{rm}^{0\to 2/3}$		0apggsscc 001111101_2	Bn{ 0 0 1 0 1 0 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{Am}}$ 95

flip=False

{1, 2, 7}{1, 3, 4}{1, 6, 5}{2, 5, 3}{2, 6, 4}{3, 7, 6}{4, 5, 7}

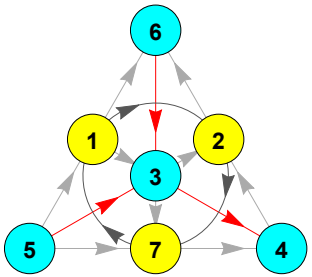
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	e_4	$-e_3$	$-e_6$	e_5	$-e_2$
e_2	e_2	$-e_7$	−1	$-e_5$	$-e_6$	e_3	e_4	e_1
e_3	e_3	$-e_4$	e_5	−1	e_1	$-e_2$	$-e_7$	e_6
e_4	e_4	e_3	e_6	$-e_1$	−1	e_7	$-e_2$	$-e_5$
e_5	e_5	e_6	$-e_3$	e_2	$-e_7$	−1	$-e_1$	e_4
e_6	e_6	$-e_5$	$-e_4$	e_7	e_2	e_1	−1	$-e_3$
e_7	e_7	e_2	$-e_1$	$-e_6$	e_5	$-e_4$	e_3	−1

split=1

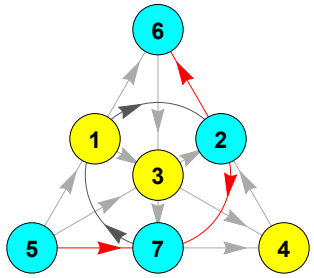
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	4	−3	−6	5	−2
2	−7	−1	−5	−6	3	4	1
3	−4	5	1	−1	2	7	6
4	3	6	1	1	−7	2	−5
5	6	−3	−2	7	1	1	4
6	−5	−4	−7	−2	−1	1	−3
7	2	−1	−6	5	−4	3	−1

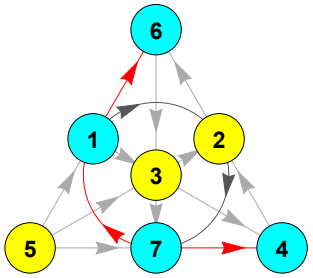
split=2

Fano plane



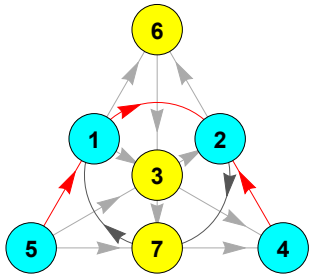
split=4

Fano plane



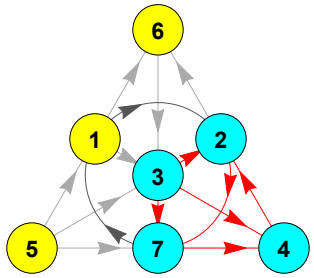
split=6

Fano plane



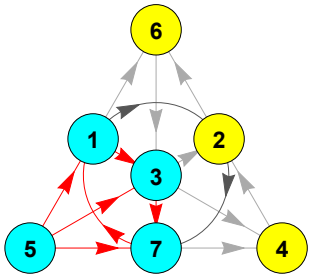
split=3

Fano plane



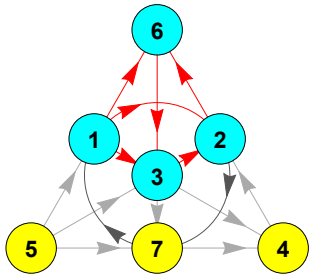
split=5

Fano plane



split=7

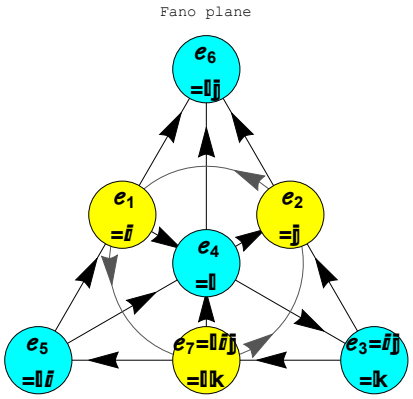
Fano plane



flip=True

{1, 7, 2}{1, 4, 3}{1, 6, 5}{2, 6, 3}{2, 5, 4}{3, 7, 5}{4, 6, 7}

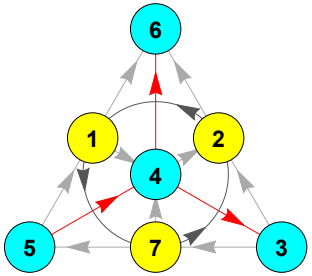
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_7$	$-e_4$	e_3	$-e_6$	e_5	e_2
e_2	e_2	e_7	−1	$-e_6$	$-e_5$	e_4	e_3	$-e_1$
e_3	e_3	e_4	e_6	−1	$-e_1$	$-e_7$	$-e_2$	e_5
e_4	e_4	$-e_3$	e_5	e_1	−1	$-e_2$	e_7	$-e_6$
e_5	e_5	e_6	$-e_4$	e_7	e_2	−1	$-e_1$	$-e_3$
e_6	e_6	$-e_5$	$-e_3$	e_2	$-e_7$	e_1	−1	e_4
e_7	e_7	$-e_2$	e_1	$-e_5$	e_6	e_3	$-e_4$	−1

split=1

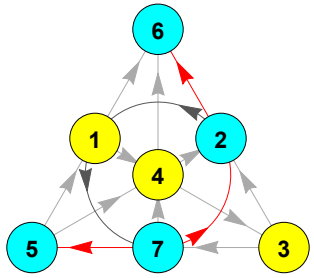
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−4	3	−6	5	2
2	7	−1	−6	−5	4	3	−1
3	4	6	1	1	7	2	5
4	−3	5	−1	1	2	−7	−6
5	6	−4	−7	−2	1	1	−3
6	−5	−3	−2	7	−1	1	4
7	−2	1	−5	6	3	−4	−1

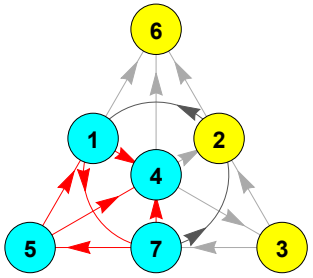
split=2

Fano plane



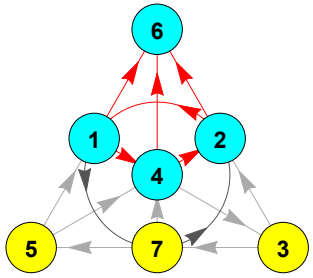
split=4

Fano plane



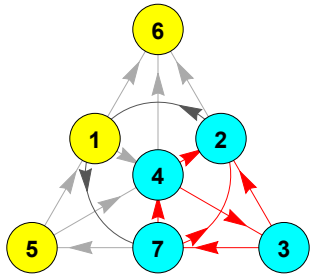
split=6

Fano plane



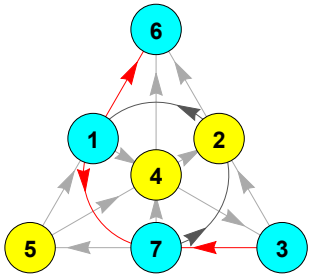
split=3

Fano plane



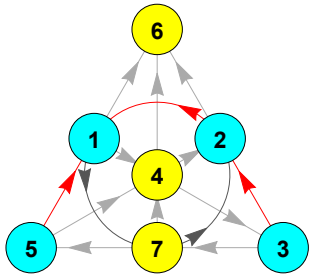
split=5

Fano plane



split=7

Fano plane

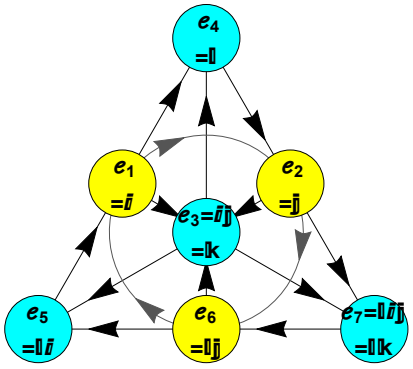


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
158			0apggsscc 010111000$_2$	Bn{	0	0	1	0	0	1	1	1	}	$\overline{Es}$
				E8{	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	99

flip=False

{1, 2, 6}{1, 3, 7}{1, 4, 5}{2, 3, 5}{2, 7, 4}{3, 4, 6}{5, 7, 6}

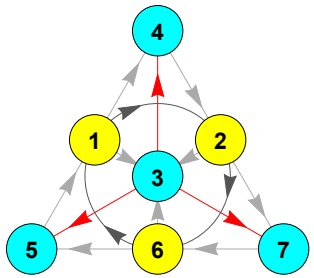
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_7	e_5	$-e_4$	$-e_2$	$-e_3$
e_2	e_2	$-e_6$	−1	e_5	$-e_7$	$-e_3$	e_1	e_4
e_3	e_3	$-e_7$	$-e_5$	−1	e_6	e_2	$-e_4$	e_1
e_4	e_4	$-e_5$	e_7	$-e_6$	−1	e_1	e_3	$-e_2$
e_5	e_5	e_4	e_3	$-e_2$	$-e_1$	−1	$-e_7$	e_6
e_6	e_6	e_2	$-e_1$	e_4	$-e_3$	e_7	−1	$-e_5$
e_7	e_7	e_3	$-e_4$	$-e_1$	e_2	$-e_6$	e_5	−1

split=1

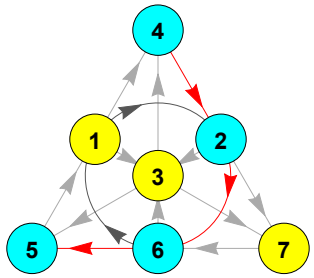
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	7	5	−4	−2	−3
2	−6	−1	5	−7	−3	1	4
3	−7	−5	1	−6	−2	−4	−1
4	−5	7	6	1	−1	3	2
5	4	3	2	1	1	−7	−6
6	2	−1	4	−3	7	−1	−5
7	3	−4	1	−2	6	5	1

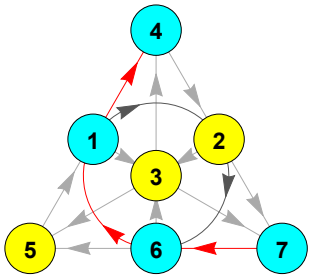
split=2

Fano plane



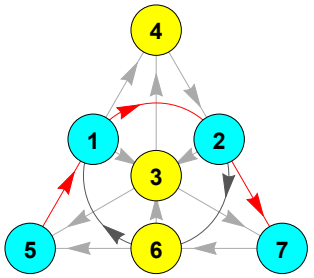
split=4

Fano plane



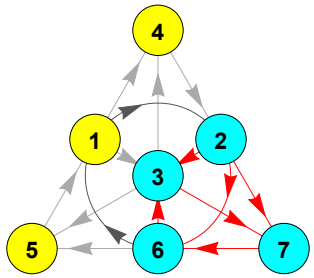
split=6

Fano plane



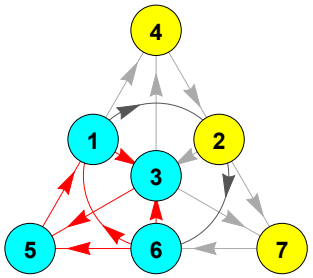
split=3

Fano plane



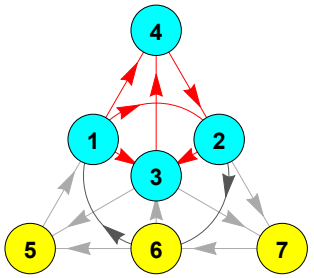
split=5

Fano plane



split=7

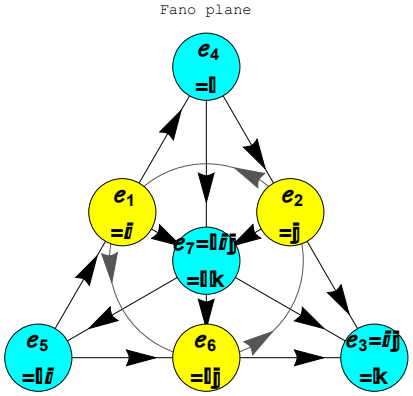
Fano plane



flip=True

{1, 6, 2}{1, 7, 3}{1, 4, 5}{2, 3, 4}{2, 7, 5}{3, 5, 6}{4, 7, 6}

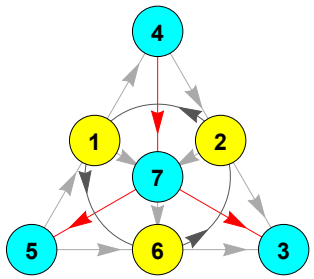
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	$-e_7$	e_5	$-e_4$	e_2	e_3
e_2	e_2	e_6	−1	e_4	$-e_3$	$-e_7$	$-e_1$	e_5
e_3	e_3	e_7	$-e_4$	−1	e_2	e_6	$-e_5$	$-e_1$
e_4	e_4	$-e_5$	e_3	$-e_2$	−1	e_1	$-e_7$	e_6
e_5	e_5	e_4	e_7	$-e_6$	$-e_1$	−1	e_3	$-e_2$
e_6	e_6	$-e_2$	e_1	e_5	e_7	$-e_3$	−1	$-e_4$
e_7	e_7	$-e_3$	$-e_5$	e_1	$-e_6$	e_2	e_4	−1

split=1

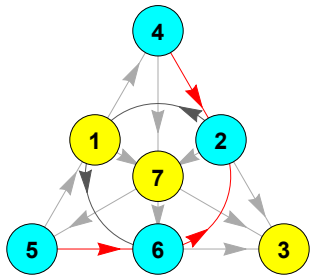
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−7	5	−4	2	3
2	6	−1	4	−3	−7	−1	5
3	7	−4	1	−2	−6	−5	1
4	−5	3	2	1	−1	−7	−6
5	4	7	6	1	1	3	2
6	−2	1	5	7	−3	−1	−4
7	−3	−5	−1	6	−2	4	1

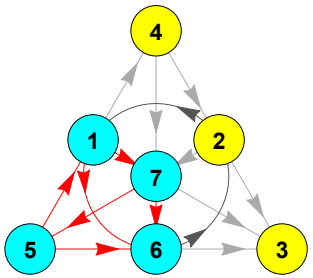
split=2

Fano plane



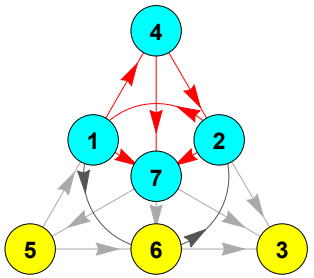
split=4

Fano plane



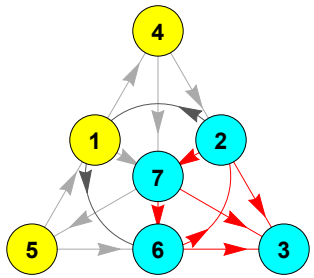
split=6

Fano plane



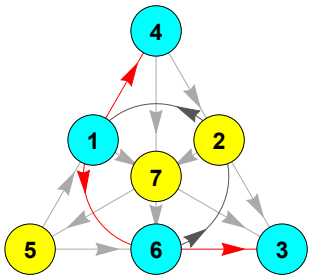
split=3

Fano plane



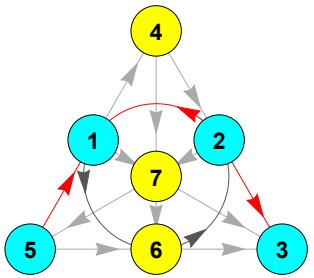
split=5

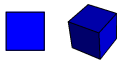
Fano plane



split=7

Fano plane

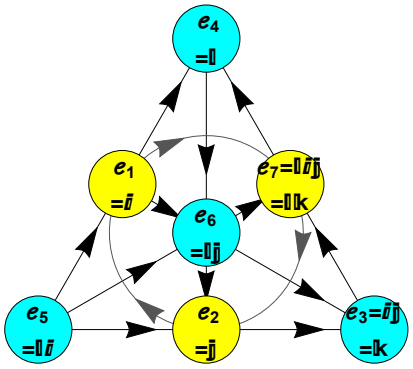


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
159	$t^{2/3\to-1/3}_{bm\ L}$		0apggsscc 001111011_2	Bn{ 0 0 0 1 1 1 1 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Ru 44

flip=False

{1, 7, 2}{1, 6, 3}{1, 4, 5}{2, 3, 5}{2, 4, 6}{3, 7, 4}{5, 6, 7}

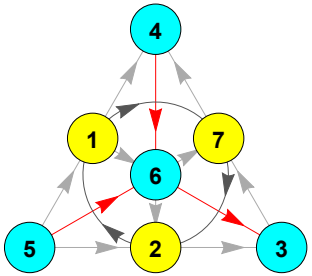
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_6$	e_5	$-e_4$	e_3	e_2
e_2	e_7	−1	e_5	e_6	$-e_3$	$-e_4$	$-e_1$
e_3	e_6	$-e_5$	−1	$-e_7$	e_2	$-e_1$	e_4
e_4	$-e_5$	$-e_6$	e_7	−1	e_1	e_2	$-e_3$
e_5	e_4	e_3	$-e_2$	$-e_1$	−1	e_7	$-e_6$
e_6	$-e_3$	e_4	e_1	$-e_2$	$-e_7$	−1	e_5
e_7	$-e_2$	e_1	$-e_4$	e_3	e_6	$-e_5$	−1

split=1

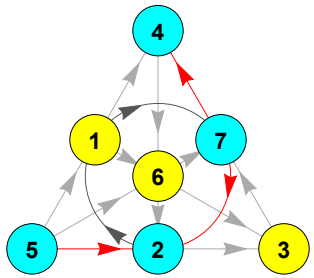
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−6	5	−4	3	2
2	7	−1	5	6	−3	−4	−1
3	6	−5	1	7	−2	1	4
4	−5	−6	−7	1	−1	−2	−3
5	4	3	2	1	1	−7	−6
6	−3	4	−1	2	7	1	5
7	−2	1	−4	3	6	−5	−1

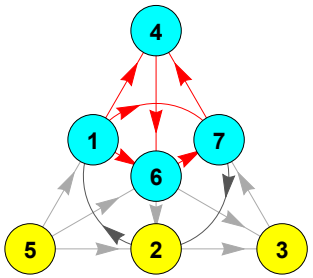
split=2

Fano plane



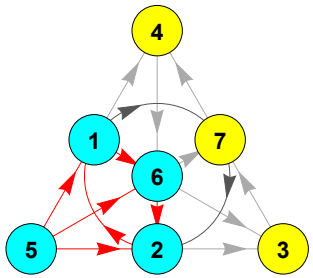
split=4

Fano plane



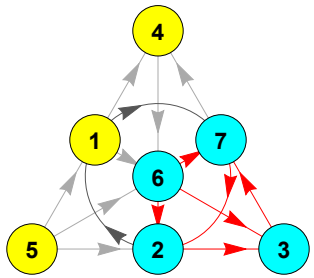
split=6

Fano plane



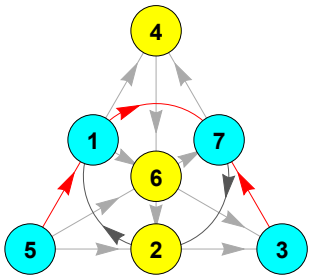
split=3

Fano plane



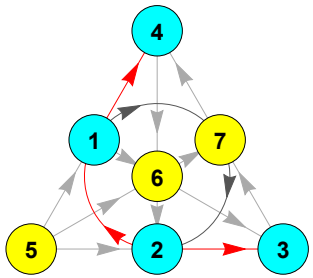
split=5

Fano plane



split=7

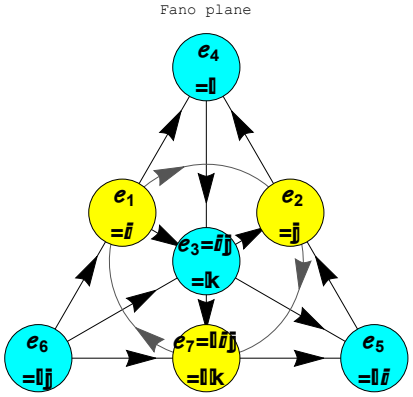
Fano plane



flip=True

{1, 2, 7}{1, 3, 5}{1, 4, 6}{2, 6, 3}{2, 4, 5}{3, 7, 4}{5, 6, 7}

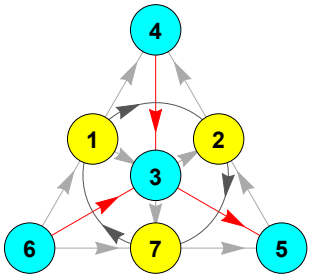
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_5	e_6	$-e_3$	$-e_4$	$-e_2$
e_2	$-e_7$	−1	$-e_6$	e_5	$-e_4$	e_3	e_1
e_3	$-e_5$	e_6	−1	$-e_7$	e_1	$-e_2$	e_4
e_4	$-e_6$	$-e_5$	e_7	−1	e_2	e_1	$-e_3$
e_5	e_3	e_4	$-e_1$	$-e_2$	−1	e_7	$-e_6$
e_6	e_4	$-e_3$	e_2	$-e_1$	$-e_7$	−1	e_5
e_7	e_2	$-e_1$	$-e_4$	e_3	e_6	$-e_5$	−1

split=1

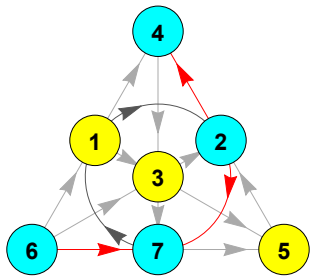
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	5	6	−3	−4	−2
2	−7	−1	−6	5	−4	3	1
3	−5	6	1	7	−1	2	4
4	−6	−5	−7	1	−2	−1	−3
5	3	4	1	2	1	−7	−6
6	4	−3	−2	1	7	1	5
7	2	−1	−4	3	6	−5	−1

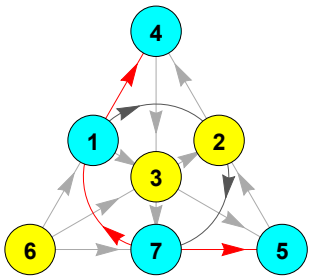
split=2

Fano plane



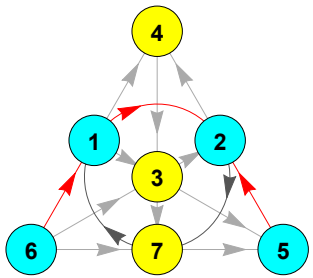
split=4

Fano plane



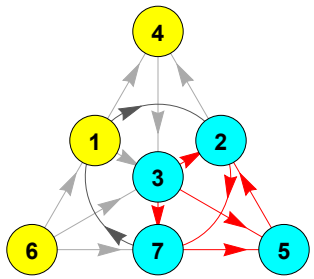
split=6

Fano plane



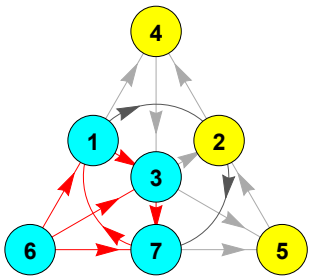
split=3

Fano plane



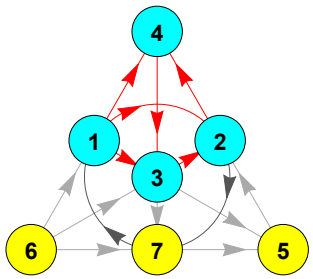
split=5

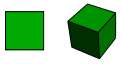
Fano plane



split=7

Fano plane

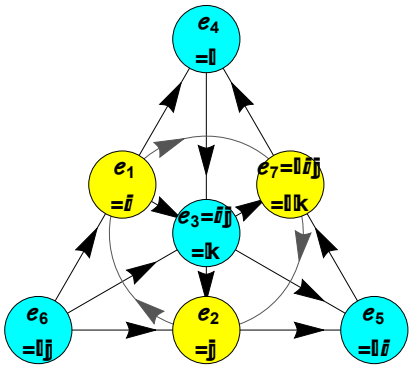


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
160	$t_{9m}^{0\to -1/3}$		0apggsscc 001111010_2	Bn{ E8{	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\overline{Cm}}$ 96

flip=False

{1, 7, 2}{1, 3, 5}{1, 4, 6}{2, 4, 3}{2, 5, 6}{3, 7, 6}{4, 5, 7}

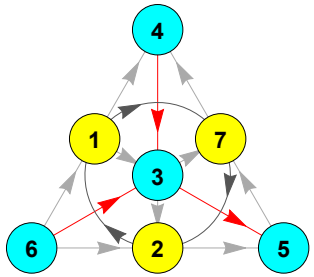
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_5	e_6	$-e_3$	$-e_4$	e_2
e_2	e_7	−1	$-e_4$	e_3	e_6	$-e_5$	$-e_1$
e_3	$-e_5$	e_4	−1	$-e_2$	e_1	$-e_7$	e_6
e_4	$-e_6$	$-e_3$	e_2	−1	e_7	e_1	$-e_5$
e_5	e_3	$-e_6$	$-e_1$	$-e_7$	−1	e_2	e_4
e_6	e_4	e_5	e_7	$-e_1$	$-e_2$	−1	$-e_3$
e_7	$-e_2$	e_1	$-e_6$	e_5	$-e_4$	e_3	−1

split=1

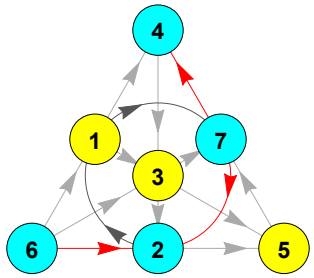
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	5	6	−3	−4	2
2	7	−1	−4	3	6	−5	−1
3	−5	4	1	2	−1	7	6
4	−6	−3	−2	1	−7	−1	−5
5	3	−6	1	7	1	−2	4
6	4	5	−7	1	2	1	−3
7	−2	1	−6	5	−4	3	−1

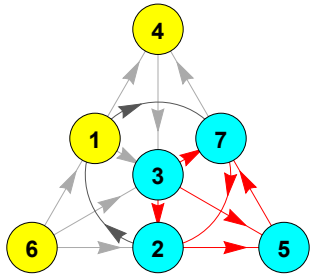
split=2

Fano plane



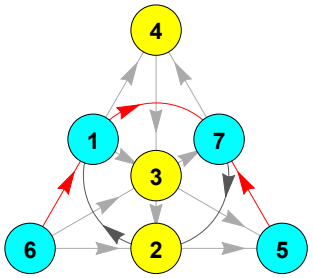
split=3

Fano plane



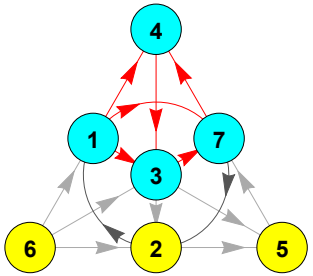
split=4

Fano plane



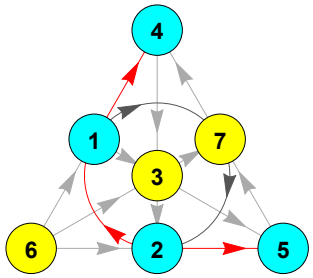
split=5

Fano plane



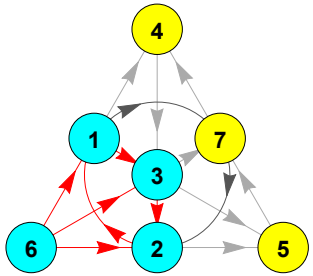
split=6

Fano plane



split=7

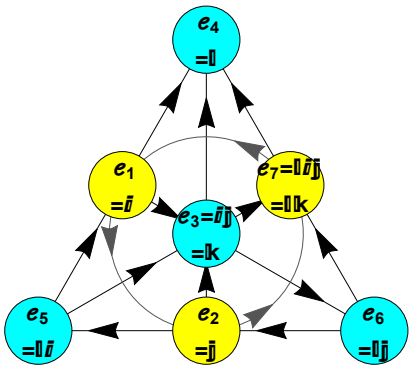
Fano plane



flip=True

{1, 2, 7}{1, 3, 6}{1, 4, 5}{2, 3, 4}{2, 5, 6}{3, 7, 5}{4, 6, 7}

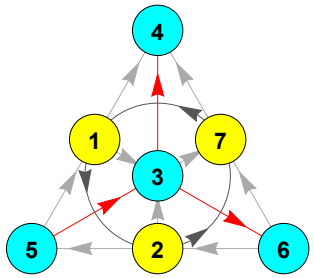
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_6	e_5	$-e_4$	$-e_3$	$-e_2$
e_2	$-e_7$	−1	e_4	$-e_3$	e_6	$-e_5$	e_1
e_3	$-e_6$	$-e_4$	−1	e_2	$-e_7$	e_1	e_5
e_4	$-e_5$	e_3	$-e_2$	−1	e_1	e_7	$-e_6$
e_5	e_4	$-e_6$	e_7	$-e_1$	−1	e_2	$-e_3$
e_6	e_3	e_5	$-e_1$	$-e_7$	$-e_2$	−1	e_4
e_7	e_2	$-e_1$	$-e_5$	e_6	e_3	$-e_4$	−1

split=1

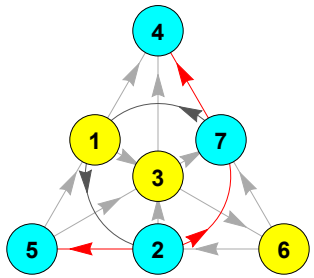
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	6	5	−4	−3	−2
2	−7	−1	4	−3	6	−5	1
3	−6	−4	1	−2	7	−1	5
4	−5	3	2	1	−1	−7	−6
5	4	−6	−7	1	1	−2	−3
6	3	5	1	7	2	1	4
7	2	−1	−5	6	3	−4	−1

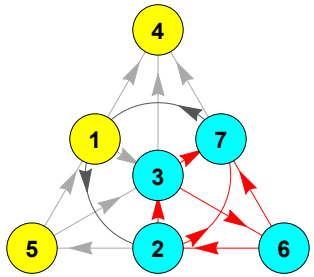
split=2

Fano plane



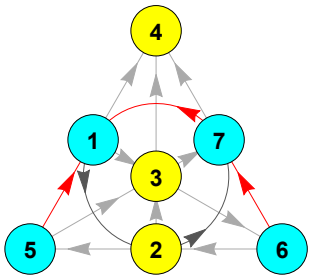
split=3

Fano plane



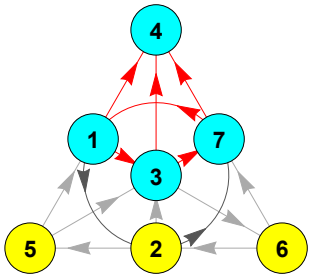
split=4

Fano plane



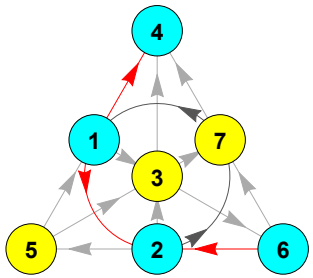
split=5

Fano plane



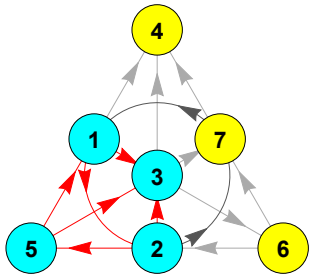
split=6

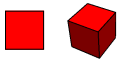
Fano plane



split=7

Fano plane

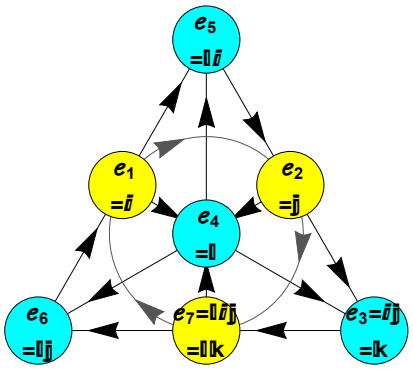


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
161	$t_{rm}^{0\to -1/3}$		0apggsscc 0011110011_2	Bn{ E8{	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Fm}}$ 100

flip=False

{1, 2, 7}{1, 4, 3}{1, 5, 6}{2, 3, 5}{2, 4, 6}{3, 7, 6}{4, 5, 7}

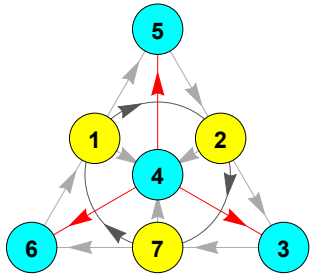
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_4$	e_3	e_6	$-e_5$	$-e_2$
e_2	$-e_7$	−1	e_5	e_6	$-e_3$	$-e_4$	e_1
e_3	e_4	$-e_5$	−1	$-e_1$	e_2	$-e_7$	e_6
e_4	$-e_3$	$-e_6$	e_1	−1	e_7	e_2	$-e_5$
e_5	$-e_6$	e_3	$-e_2$	$-e_7$	−1	e_1	e_4
e_6	e_5	e_4	e_7	$-e_2$	$-e_1$	−1	$-e_3$
e_7	e_2	$-e_1$	$-e_6$	e_5	$-e_4$	e_3	−1

split=1

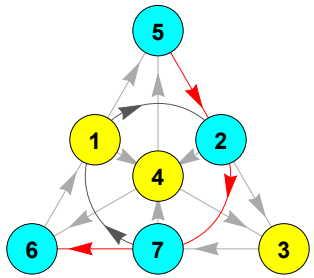
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−4	3	6	−5	−2
2	−7	−1	5	6	−3	−4	1
3	4	−5	1	1	−2	7	6
4	−3	−6	−1	1	−7	−2	−5
5	−6	3	2	7	1	−1	4
6	5	4	−7	2	1	1	−3
7	2	−1	−6	5	−4	3	−1

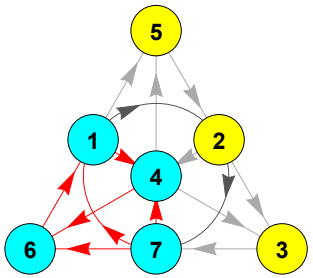
split=2

Fano plane



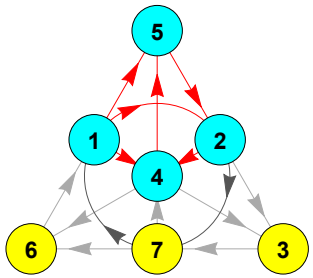
split=4

Fano plane



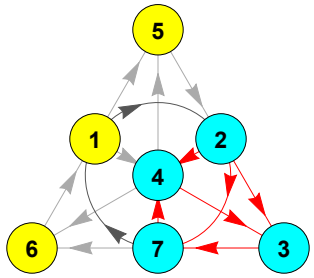
split=6

Fano plane



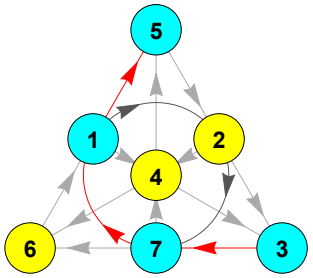
split=3

Fano plane



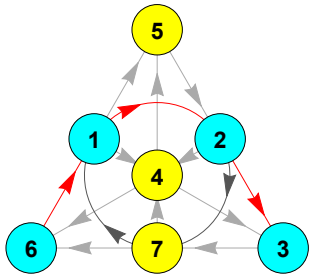
split=5

Fano plane



split=7

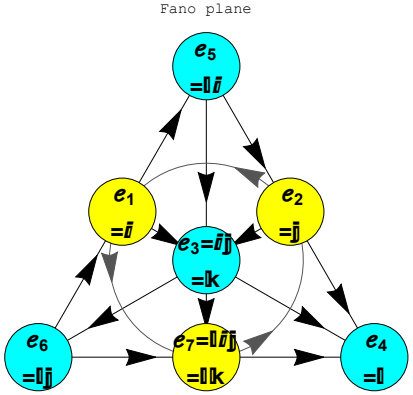
Fano plane



flip=True

{1, 7, 2}{1, 3, 4}{1, 5, 6}{2, 3, 6}{2, 4, 5}{3, 7, 5}{4, 6, 7}

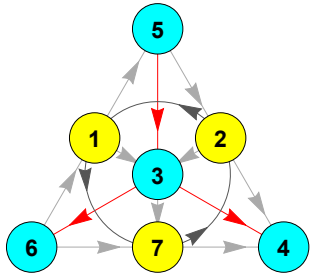
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_4	$-e_3$	e_6	$-e_5$	e_2
e_2	e_7	−1	e_6	e_5	$-e_4$	$-e_3$	$-e_1$
e_3	$-e_4$	$-e_6$	−1	e_1	$-e_7$	e_2	e_5
e_4	e_3	$-e_5$	$-e_1$	−1	e_2	e_7	$-e_6$
e_5	$-e_6$	e_4	e_7	$-e_2$	−1	e_1	$-e_3$
e_6	e_5	e_3	$-e_2$	$-e_7$	$-e_1$	−1	e_4
e_7	$-e_2$	e_1	$-e_5$	e_6	e_3	$-e_4$	−1

split=1

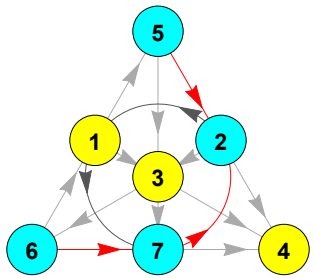
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	4	−3	6	−5	2
2	7	−1	6	5	−4	−3	−1
3	−4	−6	1	−1	7	−2	5
4	3	−5	1	1	−2	−7	−6
5	−6	4	−7	2	1	−1	−3
6	5	3	2	7	1	1	4
7	−2	1	−5	6	3	−4	−1

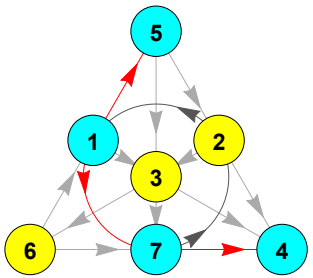
split=2

Fano plane



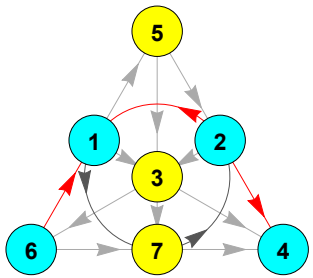
split=4

Fano plane



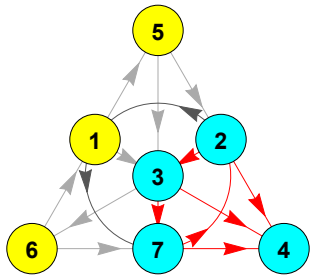
split=6

Fano plane



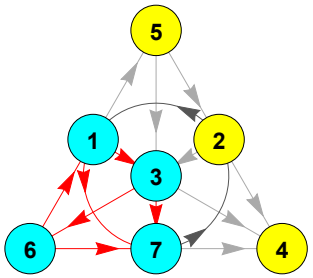
split=3

Fano plane



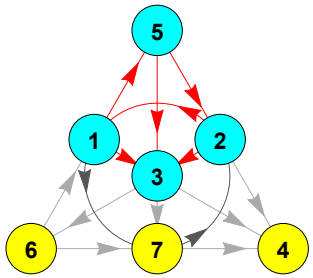
split=5

Fano plane



split=7

Fano plane

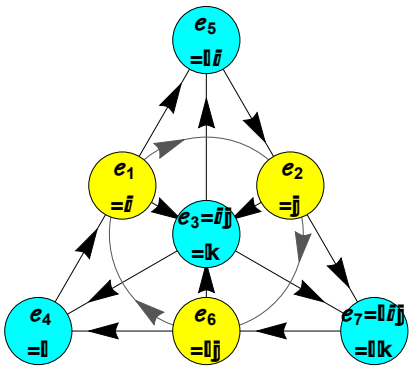


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
162	$\overline{\underset{w_m}{\overset{v_t}{}}}{}^{0}_{f}$		0apggsscc 011111000_2	Bn{ 0 0 0 1 0 1 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{Lr}}$ 103

flip=False

{1, 2, 6}{1, 3, 7}{1, 5, 4}{2, 3, 4}{2, 7, 5}{3, 5, 6}{4, 7, 6}

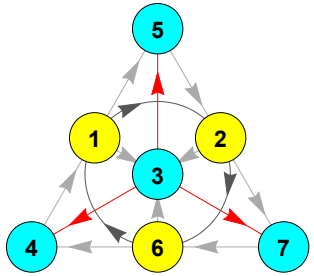
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_7	$-e_5$	e_4	$-e_2$	$-e_3$
e_2	e_2	$-e_6$	−1	e_4	$-e_3$	$-e_7$	e_1	e_5
e_3	e_3	$-e_4$	e_5	−1	e_2	e_6	$-e_5$	e_1
e_4	e_4	e_5	e_3	$-e_2$	−1	$-e_1$	$-e_7$	e_6
e_5	e_5	$-e_4$	e_7	$-e_6$	e_1	−1	e_3	$-e_2$
e_6	e_6	e_2	$-e_1$	e_5	e_7	$-e_3$	−1	$-e_4$
e_7	e_7	e_3	$-e_5$	$-e_1$	$-e_6$	e_2	e_4	−1

split=1

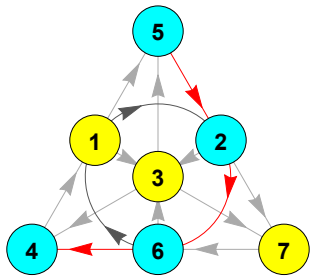
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	7	−5	4	−2	−3
2	−6	−1	4	−3	−7	1	5
3	−7	−4	1	−2	−6	−5	−1
4	5	3	2	1	1	−7	−6
5	−4	7	6	−1	1	3	2
6	2	−1	5	7	−3	−1	−4
7	3	−5	1	6	−2	4	1

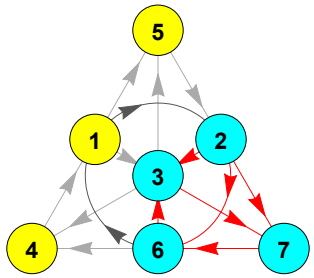
split=2

Fano plane



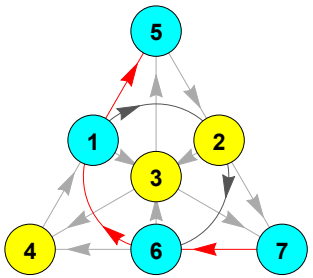
split=3

Fano plane



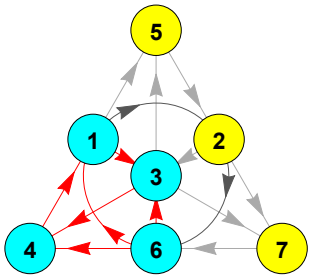
split=4

Fano plane



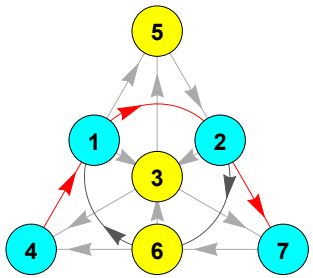
split=5

Fano plane



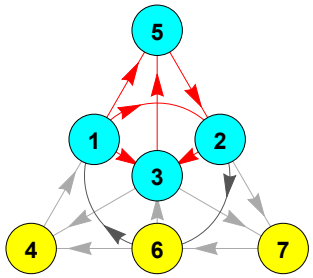
split=6

Fano plane



split=7

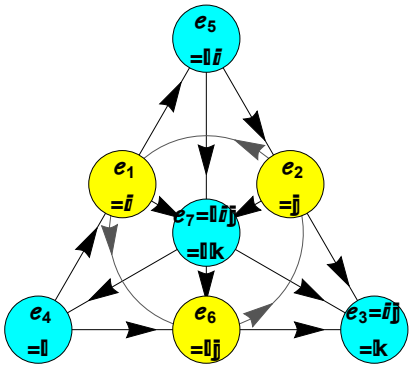
Fano plane



flip=True

{1, 6, 2}{1, 7, 3}{1, 5, 4}{2, 3, 5}{2, 7, 4}{3, 4, 6}{5, 7, 6}

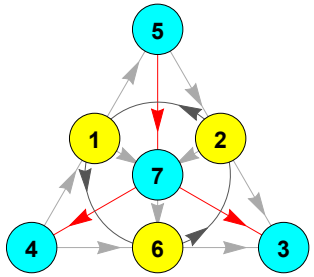
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	$-e_7$	$-e_5$	e_4	e_2	e_3
e_2	e_2	e_6	−1	e_5	$-e_7$	$-e_3$	$-e_1$	e_4
e_3	e_3	e_7	$-e_5$	−1	e_6	e_2	$-e_4$	$-e_1$
e_4	e_4	e_5	e_7	$-e_6$	−1	$-e_1$	e_3	$-e_2$
e_5	e_5	$-e_4$	e_3	$-e_2$	e_1	−1	$-e_7$	e_6
e_6	e_6	$-e_2$	e_1	e_4	$-e_3$	e_7	−1	$-e_5$
e_7	e_7	$-e_3$	$-e_4$	e_1	e_2	$-e_6$	e_5	−1

split=1

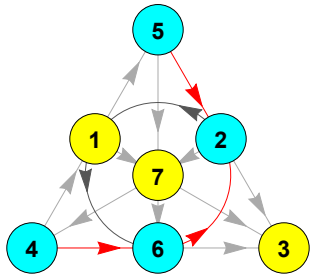
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−7	−5	4	2	3
2	6	−1	5	−7	−3	−1	4
3	7	−5	1	−6	−2	−4	1
4	5	7	6	1	1	3	2
5	−4	3	2	−1	1	−7	−6
6	−2	1	4	−3	7	−1	−5
7	−3	−4	−1	−2	6	5	1

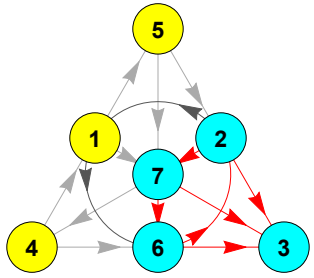
split=2

Fano plane



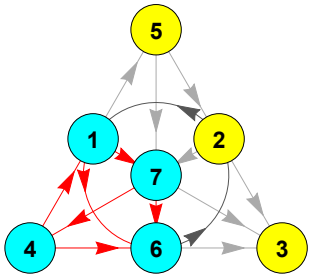
split=3

Fano plane



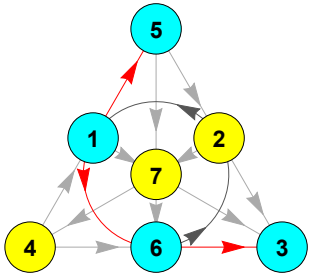
split=4

Fano plane



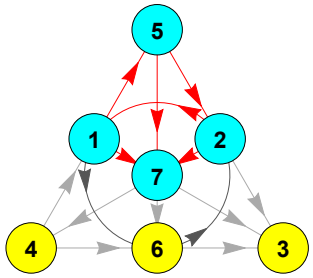
split=5

Fano plane



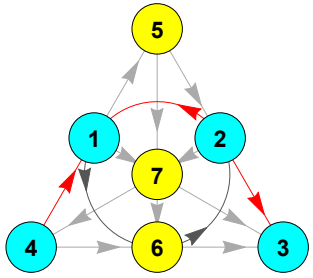
split=6

Fano plane



split=7

Fano plane

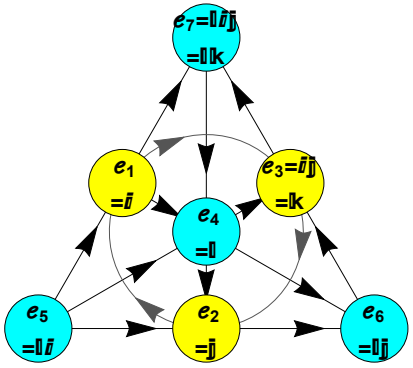


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
163	$\overline{e}^{\,+}_{y_d\,L}$	▼ ⬢	0apggsscc 010010000_2	Bn{ E8{	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{Sg}$ 106

flip=False

{1, 3, 2}{1, 4, 6}{1, 7, 5}{2, 7, 4}{2, 6, 5}{3, 5, 4}{3, 7, 6}

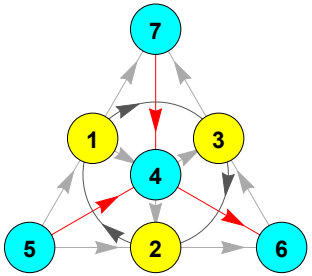
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	e_6	$-e_7$	$-e_4$	e_5
e_2	e_3	-1	$-e_1$	$-e_7$	$-e_6$	e_5	e_4
e_3	$-e_2$	e_1	-1	$-e_5$	e_4	$-e_7$	e_6
e_4	$-e_6$	e_7	e_5	-1	$-e_3$	e_1	$-e_2$
e_5	e_7	e_6	$-e_4$	e_3	-1	$-e_2$	$-e_1$
e_6	e_4	$-e_5$	e_7	$-e_1$	e_2	-1	$-e_3$
e_7	$-e_5$	$-e_4$	$-e_6$	e_2	e_1	e_3	-1

split=1

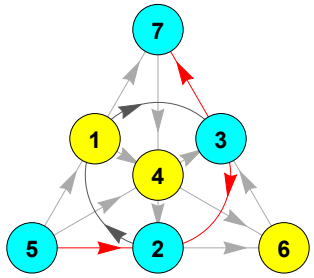
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	6	-7	-4	5
2	3	-1	-1	-7	-6	5	4
3	-2	1	-1	-5	4	-7	6
4	-6	7	5	1	3	-1	2
5	7	6	-4	-3	1	2	1
6	4	-5	7	1	-2	1	3
7	-5	-4	-6	-2	-1	-3	1

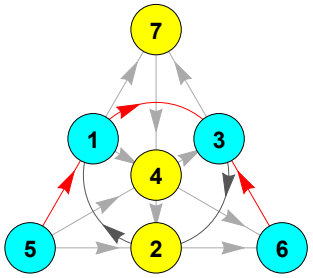
split=2

Fano plane



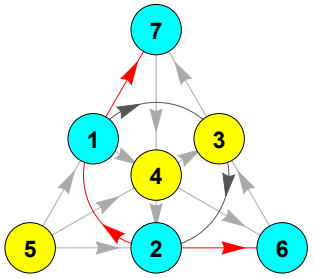
split=4

Fano plane



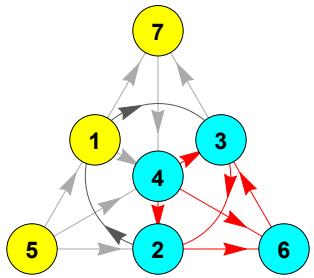
split=6

Fano plane



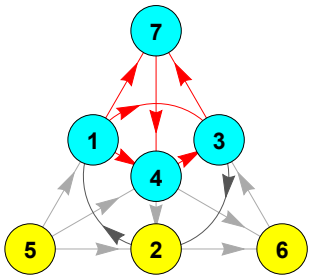
split=3

Fano plane



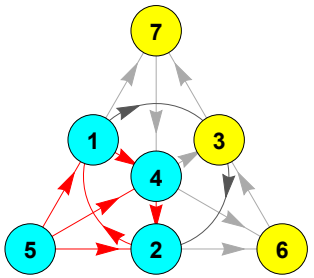
split=5

Fano plane



split=7

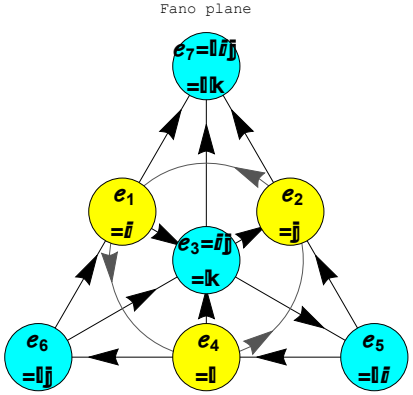
Fano plane



flip=True

{1, 4, 2}{1, 3, 5}{1, 7, 6}{2, 6, 3}{2, 7, 5}{3, 7, 4}{4, 6, 5}

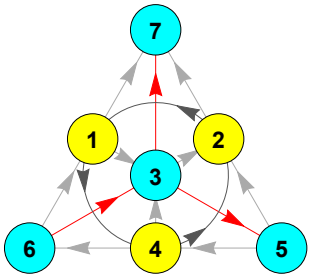
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_4$	e_5	e_2	$-e_3$	$-e_7$	e_6
e_2	e_4	-1	$-e_6$	$-e_1$	$-e_7$	e_3	e_5
e_3	$-e_5$	e_6	-1	$-e_7$	e_1	$-e_2$	e_4
e_4	$-e_2$	e_1	e_7	-1	$-e_6$	e_5	$-e_3$
e_5	e_3	e_7	$-e_1$	e_6	-1	$-e_4$	$-e_2$
e_6	e_7	$-e_3$	e_2	$-e_5$	e_4	-1	$-e_1$
e_7	$-e_6$	$-e_5$	$-e_4$	e_3	e_2	e_1	-1

split=1

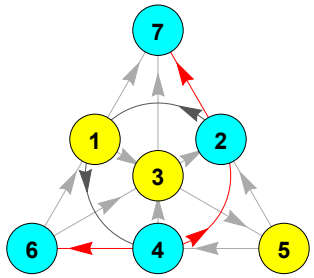
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	5	2	-3	-7	6
2	4	-1	-6	-1	-7	3	5
3	-5	6	1	-7	-1	2	-4
4	-2	1	7	-1	-6	5	-3
5	3	7	1	6	1	4	2
6	7	-3	-2	-5	-4	1	1
7	-6	-5	4	3	-2	-1	1

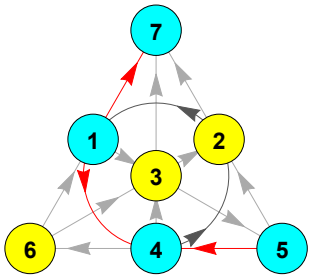
split=2

Fano plane



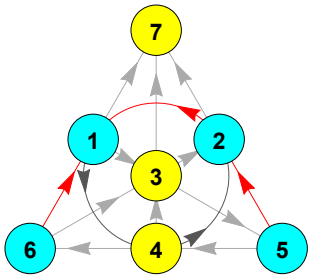
split=4

Fano plane



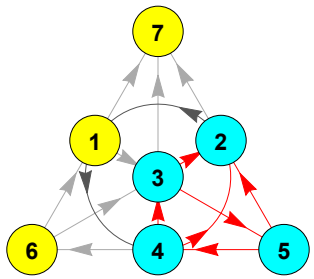
split=6

Fano plane



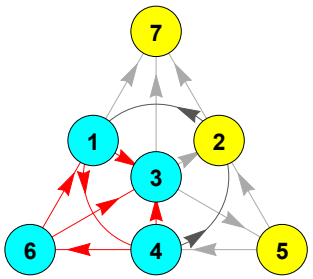
split=3

Fano plane



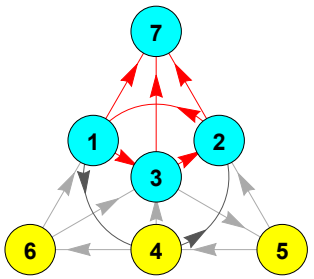
split=5

Fano plane



split=7

Fano plane

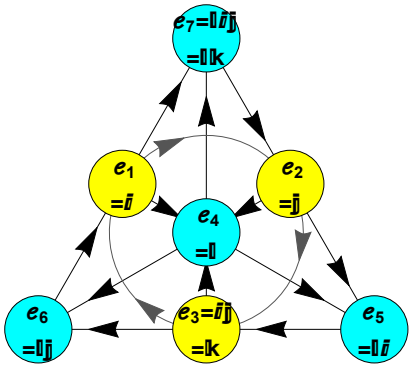


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates								Ele #
164	$\overline{g^{gb}_{Om}}^{0}_{R}$		0apggsscc	Bn{	1	1	1	1	1	0	0	0	}	Fl
			010001101_2	E8{	0	0	0	0	0	0	1	-1	}	114

flip=False

{1, 2, 3}{1, 4, 5}{1, 7, 6}{2, 4, 6}{2, 5, 7}{3, 4, 7}{3, 6, 5}

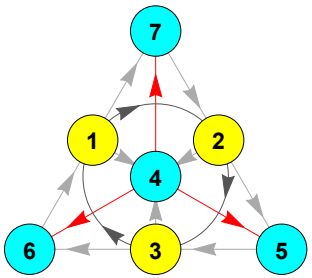
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_5	$-e_4$	$-e_7$	e_6
e_2	$-e_3$	-1	e_1	e_6	e_7	$-e_4$	$-e_5$
e_3	e_2	$-e_1$	-1	e_7	$-e_6$	e_5	$-e_4$
e_4	$-e_5$	$-e_6$	$-e_7$	-1	e_1	e_2	e_3
e_5	e_4	$-e_7$	e_6	$-e_1$	-1	$-e_3$	e_2
e_6	e_7	e_4	$-e_5$	$-e_2$	e_3	-1	$-e_1$
e_7	$-e_6$	e_5	e_4	$-e_3$	$-e_2$	e_1	-1

split=1

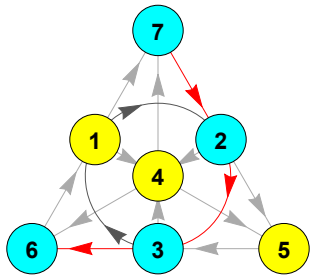
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	5	-4	-7	6
2	-3	-1	1	6	7	-4	-5
3	2	-1	-1	7	-6	5	-4
4	-5	-6	-7	1	-1	-2	-3
5	4	-7	6	1	1	3	-2
6	7	4	-5	2	-3	1	1
7	-6	5	4	3	2	-1	1

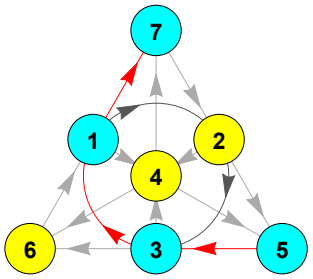
split=2

Fano plane



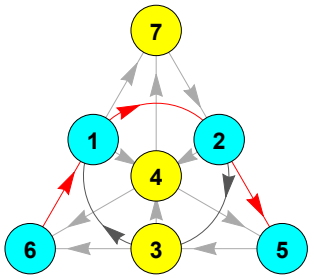
split=4

Fano plane



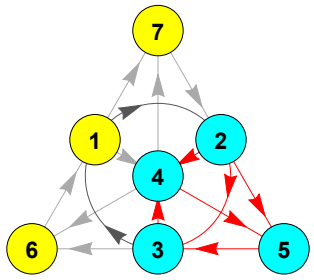
split=6

Fano plane



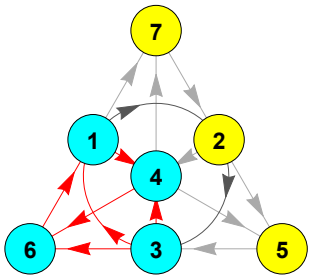
split=3

Fano plane



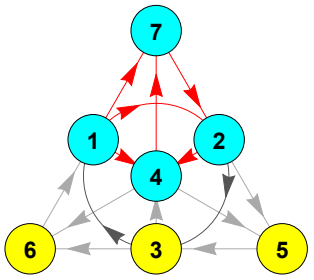
split=5

Fano plane



split=7

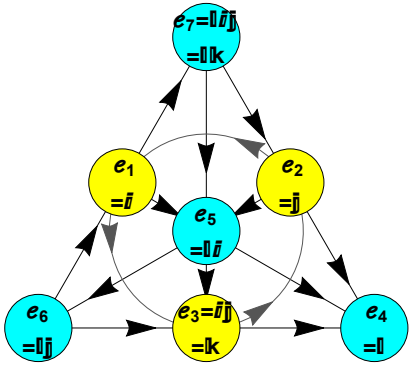
Fano plane



flip=True

{1, 3, 2}{1, 5, 4}{1, 7, 6}{2, 4, 7}{2, 5, 6}{3, 4, 6}{3, 7, 5}

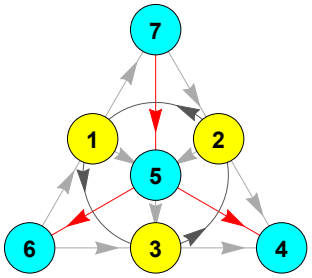
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_5$	e_4	$-e_7$	e_6
e_2	e_3	-1	$-e_1$	e_7	e_6	$-e_5$	$-e_4$
e_3	$-e_2$	e_1	-1	e_6	$-e_7$	$-e_4$	e_5
e_4	e_5	$-e_7$	$-e_6$	-1	$-e_1$	e_3	e_2
e_5	$-e_4$	$-e_6$	e_7	e_1	-1	e_2	$-e_3$
e_6	e_7	e_5	e_4	$-e_3$	$-e_2$	-1	$-e_1$
e_7	$-e_6$	e_4	$-e_5$	$-e_2$	e_3	e_1	-1

split=1

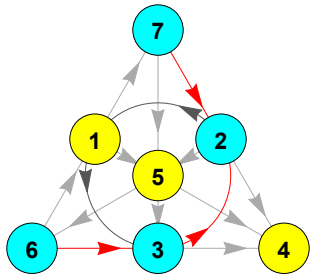
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-5	4	-7	6
2	3	-1	-1	7	6	-5	-4
3	-2	1	-1	6	-7	-4	5
4	5	-7	-6	1	1	-3	-2
5	-4	-6	7	-1	1	-2	3
6	7	5	4	3	2	1	1
7	-6	4	-5	2	-3	-1	1

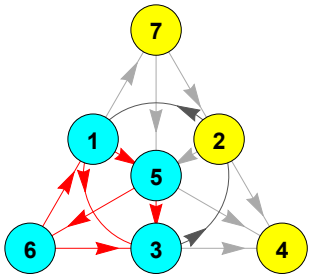
split=2

Fano plane



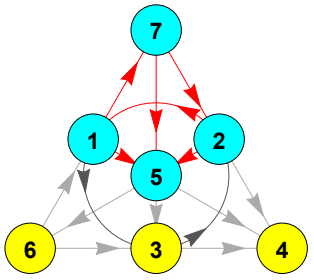
split=4

Fano plane



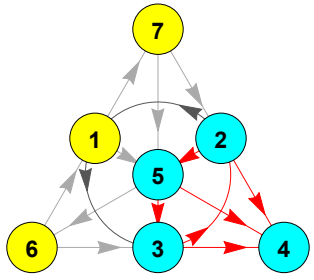
split=6

Fano plane



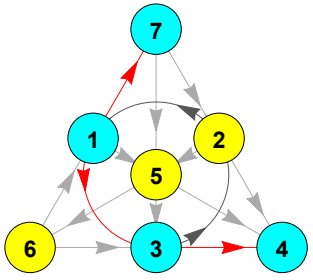
split=3

Fano plane



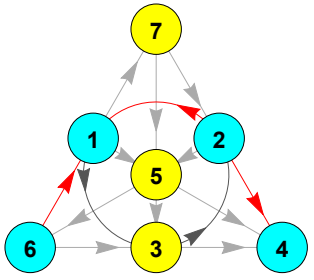
split=5

Fano plane



split=7

Fano plane

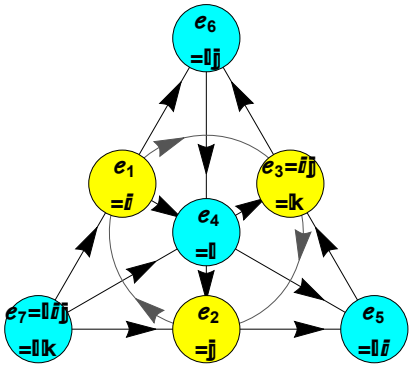


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits									Binary / E8 Coordinates	Ele #
165	$\overline{\Phi x_1}^{\,0\to 2/3}_{\circ_1}$		0apggsscc	Bn{	1	1	1	1	0	1	0	0	}	$\overline{\text{Uut}}$
			010000101_2	E8{	0	0	0	0	0	0	1	1	}	113

flip=False

{1, 3, 2}{1, 4, 5}{1, 6, 7}{2, 6, 4}{2, 5, 7}{3, 7, 4}{3, 6, 5}

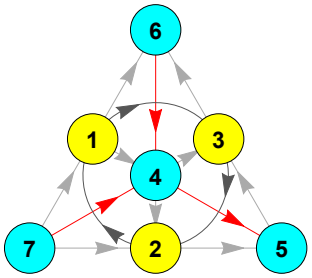
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	e_5	$-e_4$	e_7	$-e_6$
e_2	e_3	−1	$-e_1$	$-e_6$	e_7	e_4	$-e_5$
e_3	$-e_2$	e_1	−1	$-e_7$	$-e_6$	e_5	e_4
e_4	$-e_5$	e_6	e_7	−1	e_1	$-e_2$	$-e_3$
e_5	e_4	$-e_7$	e_6	$-e_1$	−1	$-e_3$	e_2
e_6	$-e_7$	$-e_4$	$-e_5$	e_2	e_3	−1	e_1
e_7	e_6	e_5	$-e_4$	e_3	$-e_2$	$-e_1$	−1

split=1

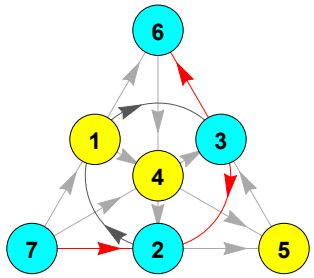
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	5	−4	7	−6
2	3	−1	−1	−6	7	4	−5
3	−2	1	−1	−7	−6	5	4
4	−5	6	7	1	−1	2	3
5	4	−7	6	1	1	3	−2
6	−7	−4	−5	−2	−3	1	−1
7	6	5	−4	−3	2	1	1

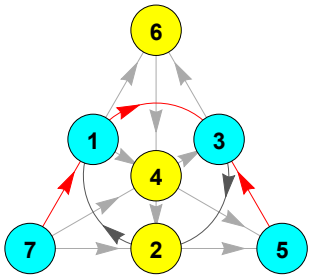
split=2

Fano plane



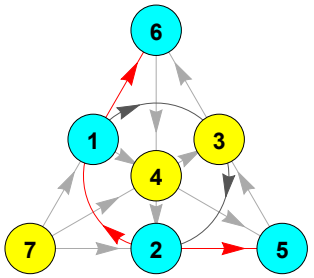
split=4

Fano plane



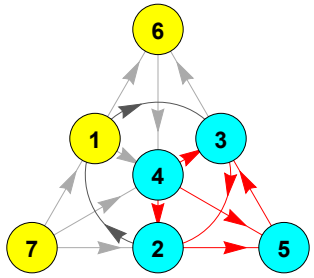
split=6

Fano plane



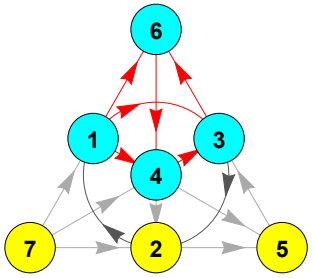
split=3

Fano plane



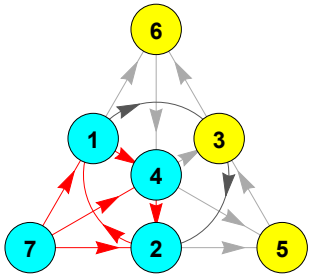
split=5

Fano plane



split=7

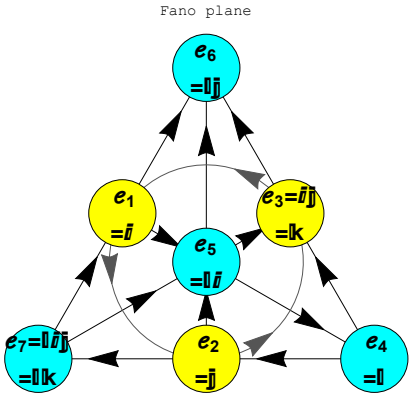
Fano plane



flip=True

{1, 2, 3}{1, 5, 4}{1, 6, 7}{2, 7, 4}{2, 5, 6}{3, 6, 4}{3, 7, 5}

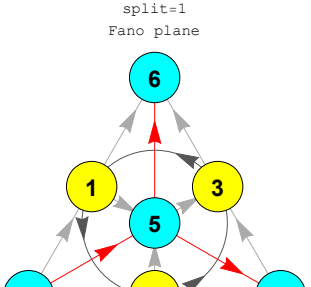
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	$-e_5$	e_4	e_7	$-e_6$
e_2	$-e_3$	−1	e_1	$-e_7$	e_6	$-e_5$	e_4
e_3	e_2	$-e_1$	−1	$-e_6$	$-e_7$	e_4	e_5
e_4	e_5	e_7	e_6	−1	$-e_1$	$-e_3$	$-e_2$
e_5	$-e_4$	$-e_6$	e_7	e_1	−1	e_2	$-e_3$
e_6	$-e_7$	e_5	$-e_4$	e_3	$-e_2$	−1	e_1
e_7	e_6	$-e_4$	$-e_5$	e_2	e_3	$-e_1$	−1

split=1

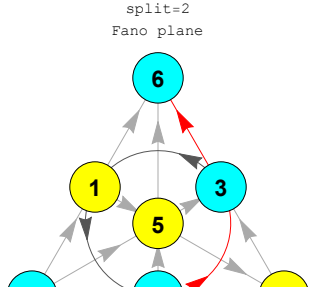
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−5	4	7	−6
2	−3	−1	1	−7	6	−5	4
3	2	−1	−1	−6	−7	4	5
4	5	7	6	1	1	3	2
5	−4	−6	7	−1	1	−2	3
6	−7	5	−4	−3	2	1	−1
7	6	−4	−5	−2	−3	1	1

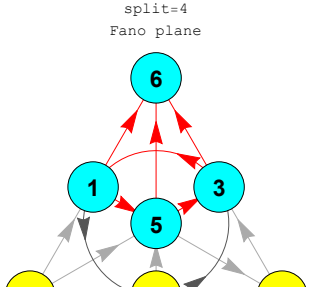
split=2

Fano plane



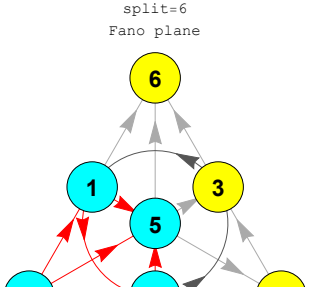
split=4

Fano plane



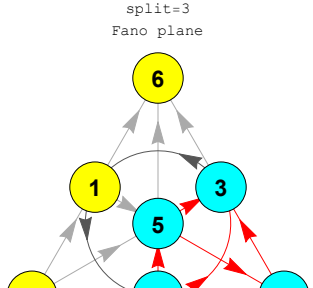
split=6

Fano plane



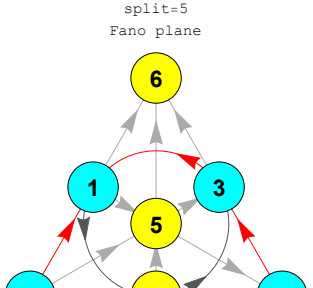
split=3

Fano plane



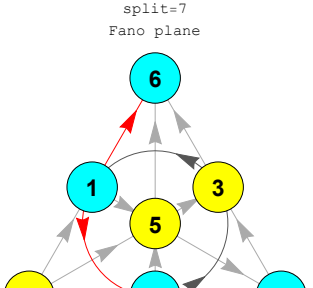
split=5

Fano plane



split=7

Fano plane

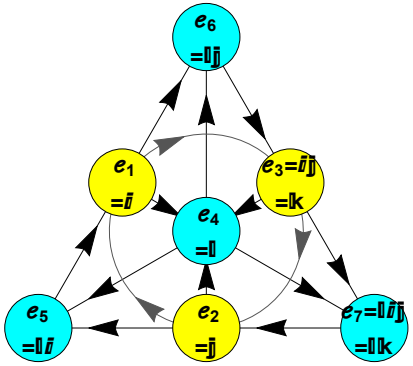


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates									Ele #
166	$\overline{g^{rg}_{mm}}{}^{0}_{R}$		0apggsscc	Bn{	1	1	1	1	0	0	1	0	}	H
			0100011111_2	E8{	0	0	0	0	0	1	-1	0	}	1

flip=False

{1, 3, 2}{1, 4, 7}{1, 6, 5}{2, 4, 6}{2, 5, 7}{3, 4, 5}{3, 7, 6}

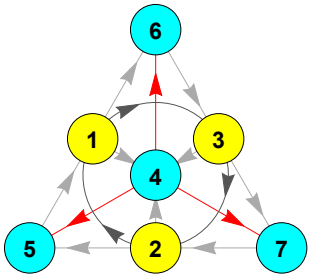
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_3$	e_2	e_7	$-e_6$	e_5	$-e_4$
e_2	e_3	$-e_3$	−1	$-e_1$	e_6	e_7	$-e_4$	$-e_5$
e_3	$-e_2$	e_1	$-e_1$	−1	e_5	$-e_4$	$-e_7$	e_6
e_4	$-e_7$	$-e_6$	$-e_5$	$-e_1$	−1	e_3	e_2	e_1
e_5	e_6	$-e_7$	e_4	$-e_3$	$-e_1$	−1	e_2	e_3
e_6	$-e_5$	e_4	e_7	$-e_2$	e_1	$-e_1$	−1	$-e_3$
e_7	e_4	e_5	$-e_6$	$-e_1$	$-e_2$	e_3	$-e_1$	−1

split=1

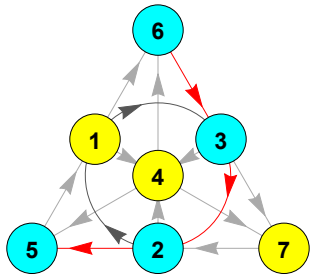
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	7	−6	5	−4
2	3	−1	−1	6	7	−4	−5
3	−2	1	−1	5	−4	−7	6
4	−7	−6	−5	1	−3	−2	−1
5	6	−7	4	3	1	1	−2
6	−5	4	7	2	−1	1	3
7	4	5	−6	1	2	−3	1

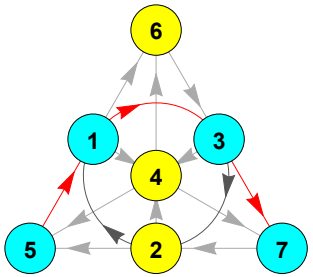
split=2

Fano plane



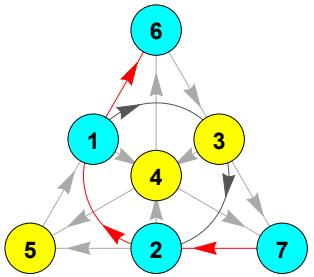
split=4

Fano plane



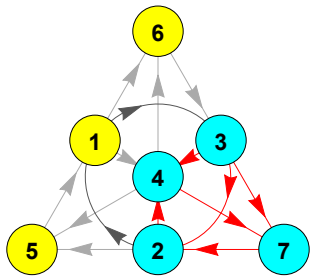
split=6

Fano plane



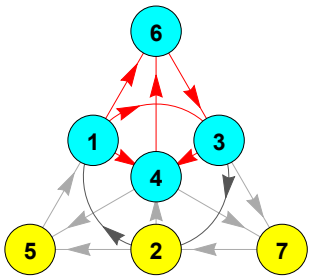
split=3

Fano plane



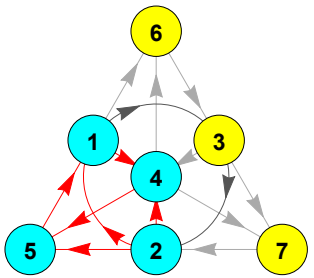
split=5

Fano plane



split=7

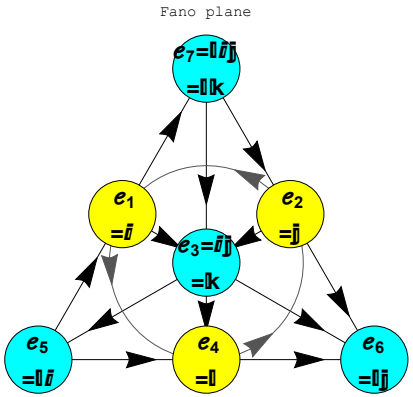
Fano plane



flip=True

{1, 4, 2}{1, 3, 6}{1, 7, 5}{2, 3, 5}{2, 6, 7}{3, 4, 7}{4, 6, 5}

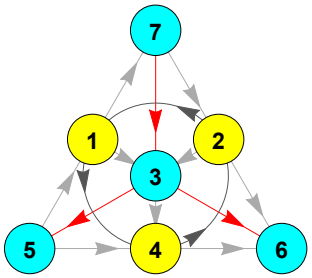
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_4$	e_6	e_2	$-e_7$	$-e_3$	e_5
e_2	e_4	−1	e_5	$-e_1$	$-e_3$	e_7	$-e_6$	
e_3	$-e_6$	$-e_5$	−1	e_7	e_2	e_1	$-e_4$	
e_4	$-e_2$	e_1	$-e_7$	−1	$-e_6$	e_5	e_3	
e_5	e_7	e_3	$-e_2$	e_6	−1	$-e_4$	$-e_1$	
e_6	e_3	$-e_7$	$-e_1$	$-e_5$	e_4	−1	e_2	
e_7	$-e_5$	e_6	e_4	$-e_3$	e_1	$-e_2$	−1	

split=1

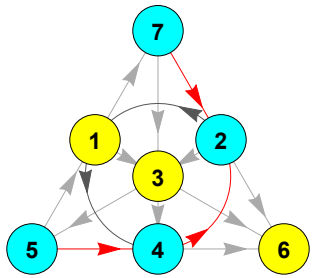
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	6	2	−7	−3	5
2	4	−1	5	−1	−3	7	−6
3	−6	−5	1	7	−2	−1	4
4	−2	1	−7	−1	−6	5	3
5	7	3	2	6	1	4	1
6	3	−7	1	−5	−4	1	−2
7	−5	6	−4	−3	−1	2	1

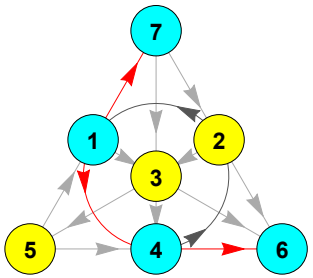
split=2

Fano plane



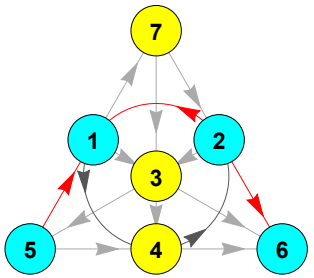
split=4

Fano plane



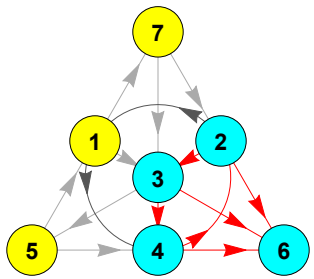
split=6

Fano plane



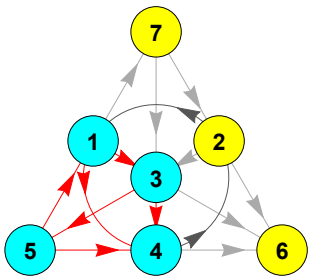
split=3

Fano plane



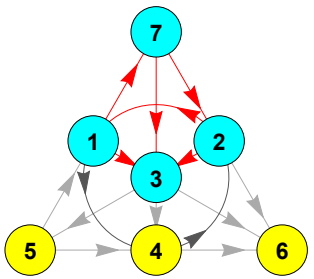
split=5

Fano plane



split=7

Fano plane

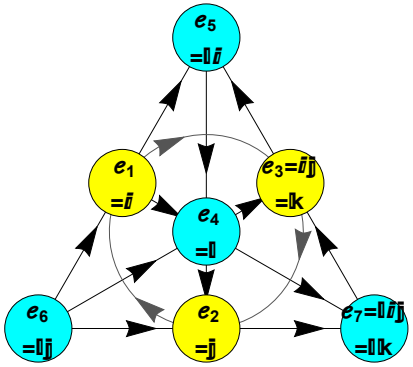


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
167	g^{rb}_{cm} $^{0}_{R}$		0apggsscc	Bn{	1	1	1	1	0	0	0	1	}	Uup
			000001110_2	E8{	0	0	0	0	0	1	0	-1	}	115

flip=False

{1, 3, 2}{1, 4, 7}{1, 5, 6}{2, 5, 4}{2, 7, 6}{3, 6, 4}{3, 5, 7}

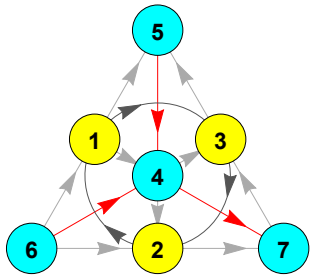
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	$-e_3$	e_2	e_7	e_6	$-e_5$	$-e_4$
e_2	e_3	$-e_1$	-1	$-e_1$	$-e_5$	e_4	$-e_7$	e_6
e_3	$-e_2$	e_1	$-e_1$	-1	$-e_6$	e_7	e_4	$-e_5$
e_4	$-e_7$	e_5	e_6	-1	$-e_2$	$-e_3$	e_1	
e_5	$-e_6$	$-e_4$	$-e_7$	e_2	-1	e_1	e_3	
e_6	e_5	e_7	$-e_4$	e_3	$-e_1$	-1	$-e_2$	
e_7	e_4	$-e_6$	e_5	$-e_1$	$-e_3$	e_2	-1	

split=1

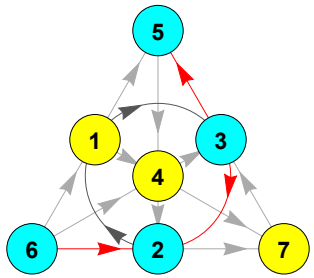
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	7	6	-5	-4
2	3	-1	-1	-5	4	-7	6
3	-2	1	-1	-6	7	4	-5
4	-7	5	6	1	2	3	-1
5	-6	-4	-7	-2	1	-1	-3
6	5	7	-4	-3	1	1	2
7	4	-6	5	1	3	-2	1

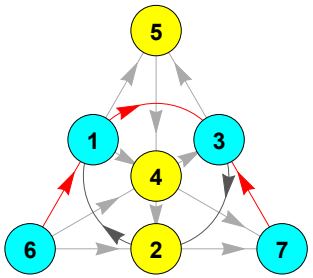
split=2

Fano plane



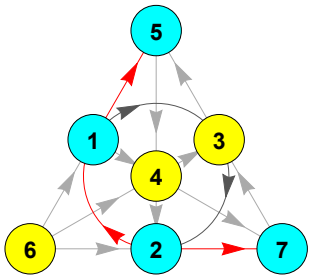
split=4

Fano plane



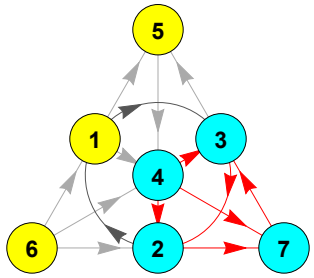
split=6

Fano plane



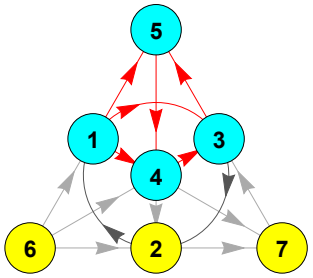
split=3

Fano plane



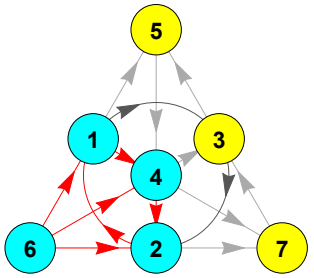
split=5

Fano plane



split=7

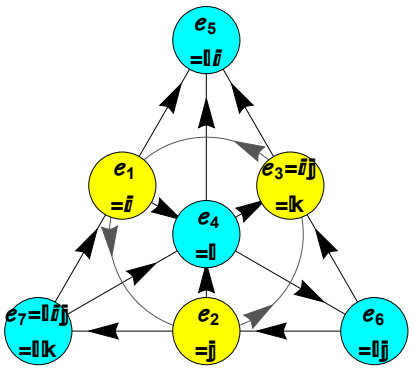
Fano plane



flip=True

{1, 2, 3}{1, 4, 6}{1, 5, 7}{2, 4, 5}{2, 7, 6}{3, 7, 4}{3, 5, 6}

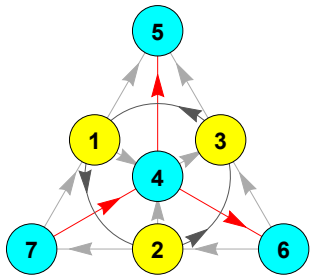
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_3	$-e_2$	e_6	e_7	$-e_4$	$-e_5$
e_2	$-e_3$	-1	e_1	e_5	$-e_4$	$-e_7$	e_6	
e_3	e_2	$-e_1$	-1	$-e_7$	e_6	$-e_5$	e_4	
e_4	$-e_6$	$-e_5$	e_7	-1	e_2	e_1	$-e_3$	
e_5	$-e_7$	e_4	$-e_6$	$-e_2$	-1	e_3	e_1	
e_6	e_4	e_7	e_5	$-e_1$	$-e_3$	-1	$-e_2$	
e_7	e_5	$-e_6$	$-e_4$	e_3	$-e_1$	e_2	-1	

split=1

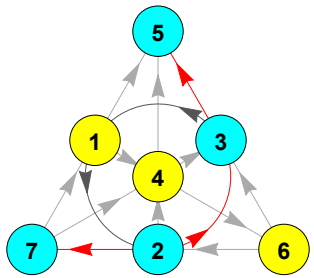
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	6	7	-4	-5
2	-3	-1	1	5	-4	-7	6
3	2	-1	-1	-7	6	-5	4
4	-6	-5	7	1	-2	-1	3
5	-7	4	-6	2	1	-3	-1
6	4	7	5	1	3	1	2
7	5	-6	-4	-3	1	-2	1

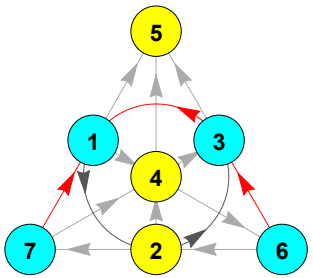
split=2

Fano plane



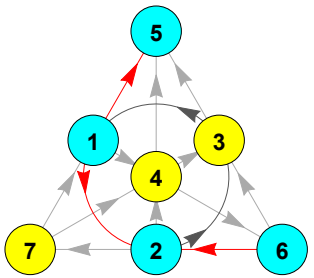
split=4

Fano plane



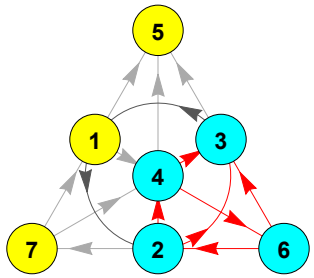
split=6

Fano plane



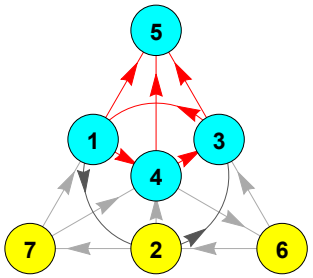
split=3

Fano plane



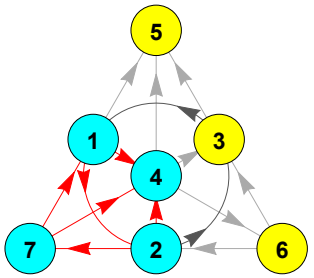
split=5

Fano plane



split=7

Fano plane

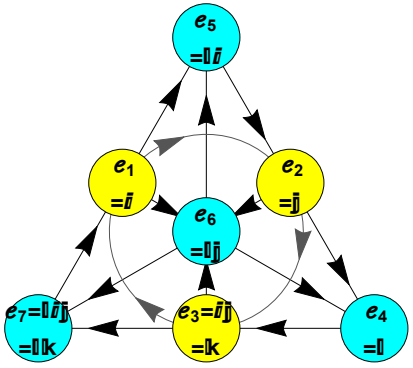


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates								Ele #
168	$\overline{\Phi X_2}^{\,0\to 2/3}_{c_1\ \mathbb{R}}$		0apggsscc 010000110_2	Bn{ E8{	1 0	1 0	1 0	0 0	1 0	1 1	0 0	0 1	} }	$\overline{Cn}$ 112

flip=False

{1, 2, 3}{1, 6, 4}{1, 5, 7}{2, 4, 5}{2, 6, 7}{3, 7, 4}{3, 6, 5}

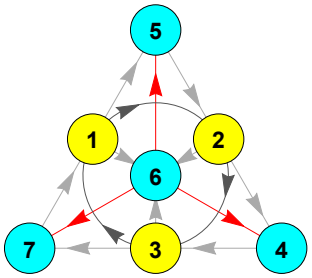
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	$-e_6$	e_7	e_4	$-e_5$
e_2	e_2	$-e_3$	−1	e_1	e_5	$-e_4$	e_7	$-e_6$
e_3	e_3	e_2	$-e_1$	−1	$-e_7$	$-e_6$	e_5	e_4
e_4	e_4	e_6	$-e_5$	e_7	−1	e_2	$-e_1$	$-e_3$
e_5	e_5	$-e_7$	e_4	e_6	$-e_2$	−1	$-e_3$	e_1
e_6	e_6	$-e_4$	$-e_7$	$-e_5$	e_1	e_3	−1	e_2
e_7	e_7	e_5	e_6	$-e_4$	e_3	$-e_1$	$-e_2$	−1

split=1

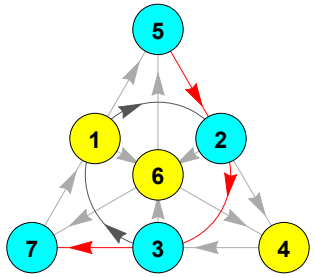
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−6	7	4	−5
2	−3	−1	1	5	−4	7	−6
3	2	−1	−1	−7	−6	5	4
4	6	−5	7	1	−2	1	3
5	−7	4	6	2	1	3	−1
6	−4	−7	−5	−1	−3	1	−2
7	5	6	−4	−3	1	2	1

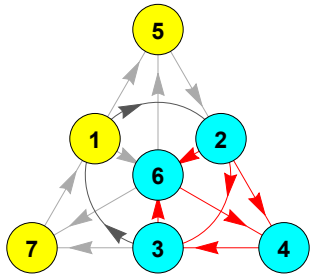
split=2

Fano plane



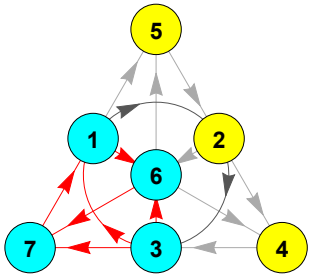
split=3

Fano plane



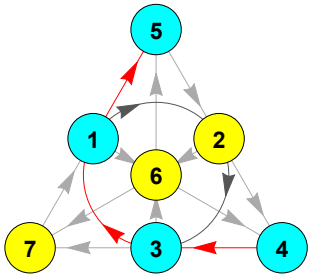
split=4

Fano plane



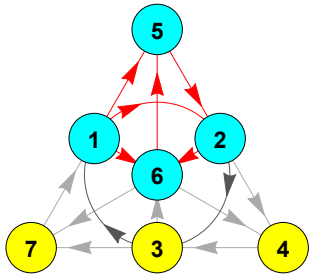
split=5

Fano plane



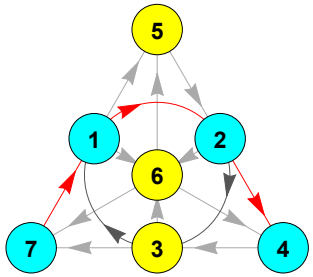
split=6

Fano plane



split=7

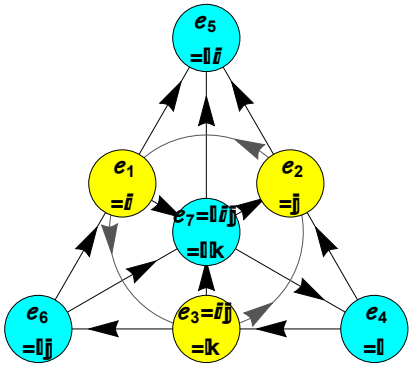
Fano plane



flip=True

{1, 3, 2}{1, 7, 4}{1, 5, 6}{2, 5, 4}{2, 6, 7}{3, 6, 4}{3, 7, 5}

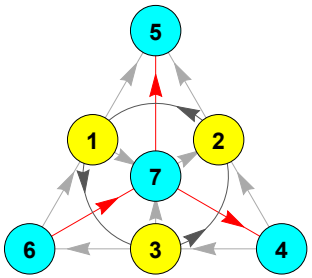
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_3$	e_2	$-e_7$	e_6	$-e_5$	e_4
e_2	e_2	e_3	−1	$-e_1$	$-e_5$	e_4	e_7	$-e_6$
e_3	e_3	$-e_2$	e_1	−1	$-e_6$	$-e_7$	e_4	e_5
e_4	e_4	e_7	e_5	e_6	−1	$-e_2$	$-e_3$	$-e_1$
e_5	e_5	$-e_6$	$-e_4$	e_7	e_2	−1	e_1	$-e_3$
e_6	e_6	e_5	$-e_7$	$-e_4$	e_3	$-e_1$	−1	e_2
e_7	e_7	$-e_4$	e_6	$-e_5$	e_1	e_3	$-e_2$	−1

split=1

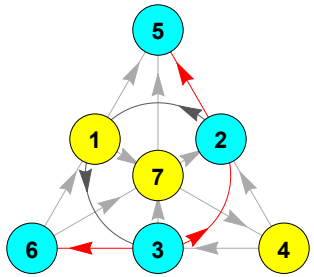
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−7	6	−5	4
2	3	−1	−1	−5	4	7	−6
3	−2	1	−1	−6	−7	4	5
4	7	5	6	1	2	3	1
5	−6	−4	7	−2	1	−1	3
6	5	−7	−4	−3	1	1	−2
7	−4	6	−5	−1	−3	2	1

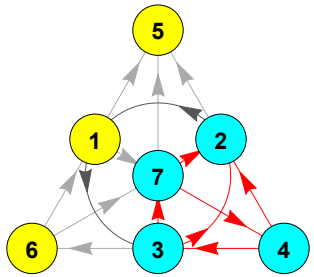
split=2

Fano plane



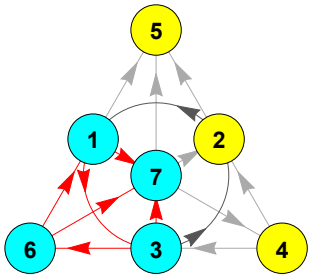
split=3

Fano plane



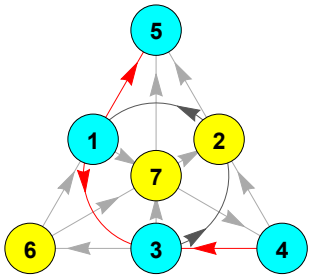
split=4

Fano plane



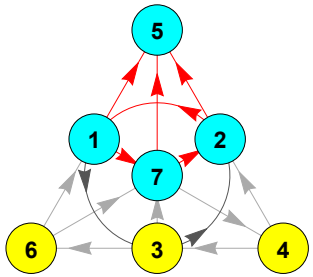
split=5

Fano plane



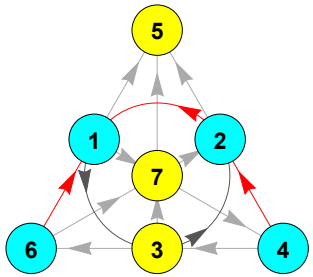
split=6

Fano plane



split=7

Fano plane

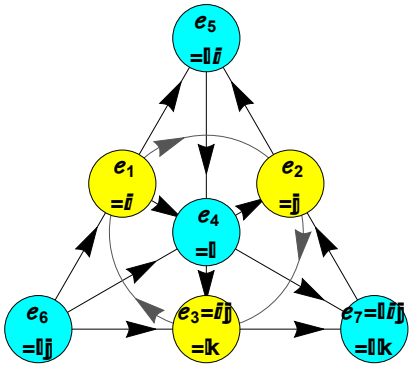


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
169	$\overline{\Phi x_3}^{0\to 2/3}_{m_1}$		0apggsscc	Bn{	1	1	1	0	1	0	1	0	}	Li
			010000111_2	E8{	0	0	0	0	0	1	1	0	}	3

flip=False

{1, 2, 3}{1, 4, 7}{1, 5, 6}{2, 6, 4}{2, 5, 7}{3, 5, 4}{3, 7, 6}

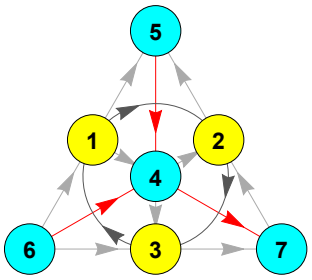
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	e_7	e_6	$-e_5$	$-e_4$
e_2	e_2	$-e_3$	−1	e_1	$-e_6$	e_7	e_4	$-e_5$
e_3	e_3	e_2	$-e_1$	−1	$-e_5$	e_4	$-e_7$	e_6
e_4	e_4	$-e_7$	e_6	e_5	−1	$-e_3$	$-e_2$	e_1
e_5	e_5	$-e_6$	$-e_7$	$-e_4$	e_3	−1	e_1	e_2
e_6	e_6	e_5	$-e_4$	e_7	e_2	$-e_1$	−1	$-e_3$
e_7	e_7	e_4	e_5	$-e_6$	$-e_1$	$-e_2$	e_3	−1

split=1

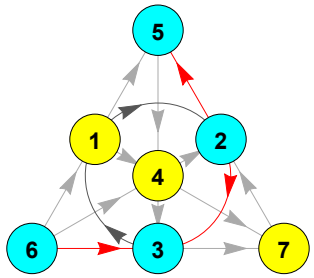
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	7	6	−5	−4
2	−3	−1	1	−6	7	4	−5
3	2	−1	−1	−5	4	−7	6
4	−7	6	5	1	3	2	−1
5	−6	−7	−4	−3	1	−1	−2
6	5	−4	7	−2	1	1	3
7	4	5	−6	1	2	−3	1

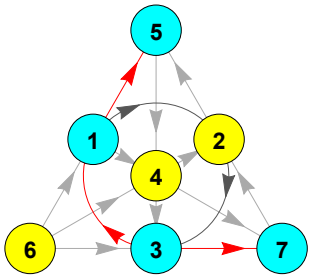
split=2

Fano plane



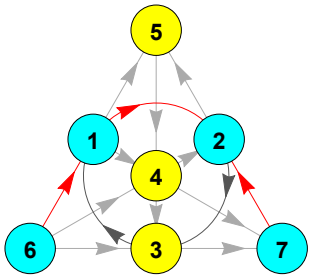
split=4

Fano plane



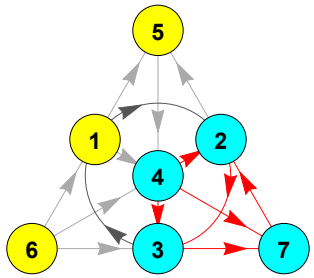
split=6

Fano plane



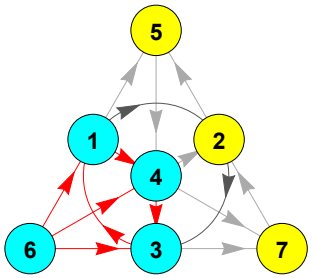
split=3

Fano plane



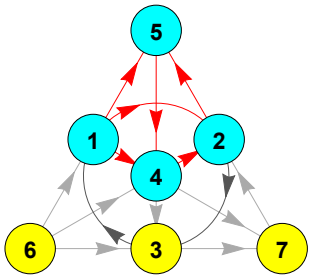
split=5

Fano plane



split=7

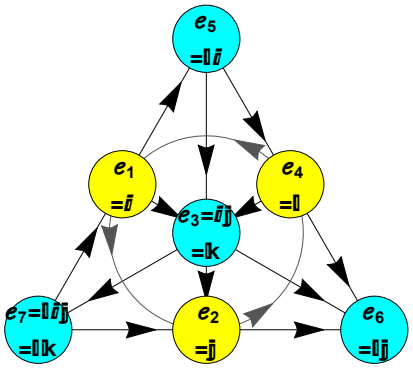
Fano plane



flip=True

{1, 2, 4}{1, 3, 6}{1, 5, 7}{2, 5, 3}{2, 6, 7}{3, 7, 4}{4, 6, 5}

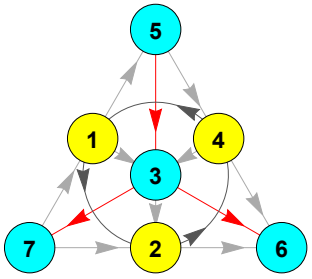
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	e_6	$-e_2$	e_7	$-e_3$	$-e_5$
e_2	e_2	$-e_4$	−1	$-e_5$	e_1	e_3	e_7	$-e_6$
e_3	e_3	$-e_6$	e_5	−1	$-e_7$	$-e_2$	e_1	e_4
e_4	e_4	e_2	$-e_1$	e_7	−1	$-e_6$	e_5	$-e_3$
e_5	e_5	$-e_7$	$-e_3$	e_2	e_6	−1	$-e_4$	e_1
e_6	e_6	e_3	$-e_7$	$-e_1$	$-e_5$	e_4	−1	e_2
e_7	e_7	e_5	e_6	$-e_4$	e_3	$-e_1$	$-e_2$	−1

split=1

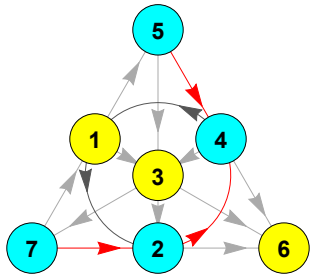
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	6	−2	7	−3	−5
2	−4	−1	−5	1	3	7	−6
3	−6	5	1	−7	2	−1	−4
4	2	−1	7	−1	−6	5	−3
5	−7	−3	−2	6	1	4	−1
6	3	−7	1	−5	−4	1	−2
7	5	6	4	3	1	2	1

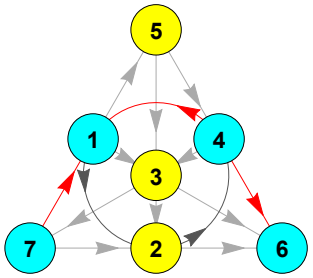
split=2

Fano plane



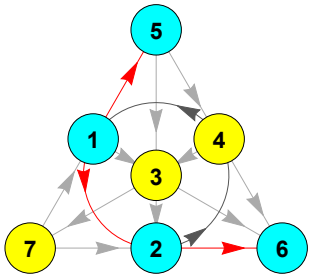
split=4

Fano plane



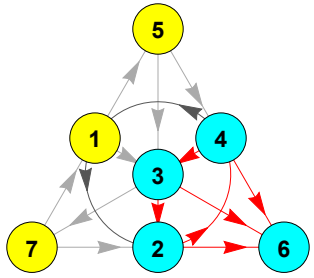
split=6

Fano plane



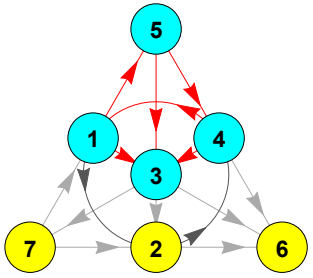
split=3

Fano plane



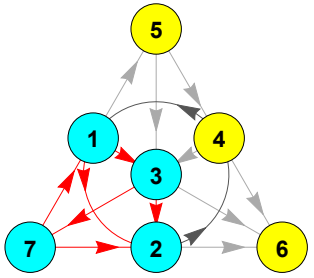
split=5

Fano plane



split=7

Fano plane

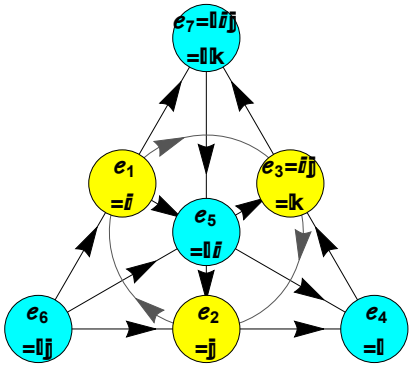


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates								Ele #
170	$\overline{\Phi x_1}^{\,0\mapsto -1/3}_{\circ_d}$		0apggsscc	010000001_2	Bn{ 1	1	1	0	1	0	0	1 }	He
					E8{ 0	0	0	0	1	-1	0	0 }	2

flip=False

{1, 3, 2}{1, 5, 4}{1, 7, 6}{2, 4, 6}{2, 7, 5}{3, 7, 4}{3, 6, 5}

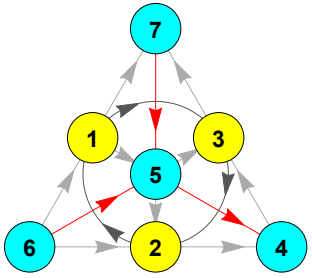
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_5$	e_4	$-e_7$	e_6
e_2	e_3	-1	$-e_1$	e_6	$-e_7$	$-e_4$	e_5
e_3	$-e_2$	e_1	-1	$-e_7$	$-e_6$	e_5	e_4
e_4	e_5	$-e_6$	e_7	-1	$-e_1$	e_2	$-e_3$
e_5	$-e_4$	e_7	e_6	e_1	-1	$-e_3$	$-e_2$
e_6	e_7	e_4	$-e_5$	$-e_2$	e_3	-1	$-e_1$
e_7	$-e_6$	$-e_5$	$-e_4$	e_3	e_2	e_1	-1

split=1

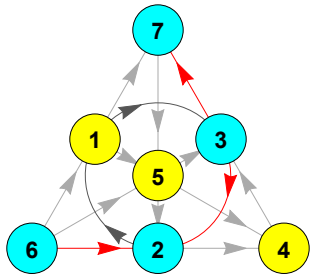
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-5	4	-7	6
2	3	-1	-1	6	-7	-4	5
3	-2	1	-1	-7	-6	5	4
4	5	-6	7	1	1	-2	3
5	-4	7	6	-1	1	3	2
6	7	4	-5	2	-3	1	1
7	-6	-5	-4	-3	-2	-1	1

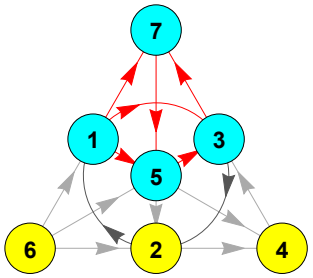
split=2

Fano plane



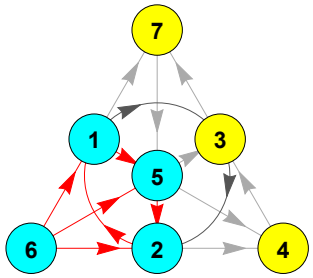
split=4

Fano plane



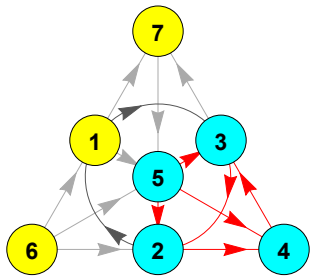
split=6

Fano plane



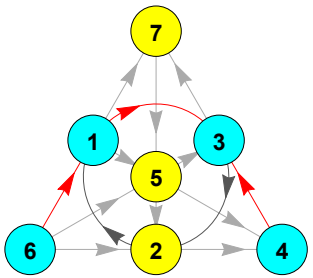
split=3

Fano plane



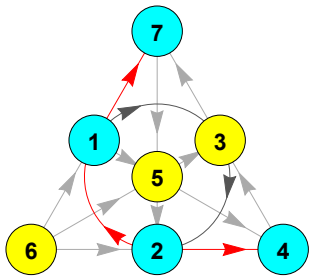
split=5

Fano plane



split=7

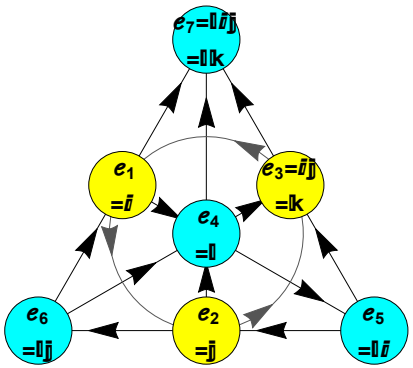
Fano plane



flip=True

{1, 2, 3}{1, 4, 5}{1, 7, 6}{2, 4, 7}{2, 6, 5}{3, 6, 4}{3, 7, 5}

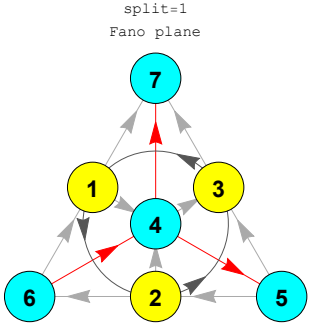
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_5	$-e_4$	$-e_7$	e_6
e_2	$-e_3$	-1	e_1	e_7	$-e_6$	e_5	$-e_4$
e_3	e_2	$-e_1$	-1	$-e_6$	$-e_7$	e_4	e_5
e_4	$-e_5$	$-e_7$	e_6	-1	e_1	$-e_3$	e_2
e_5	e_4	e_6	e_7	$-e_1$	-1	$-e_2$	$-e_3$
e_6	e_7	$-e_5$	$-e_4$	e_3	e_2	-1	$-e_1$
e_7	$-e_6$	e_4	$-e_5$	$-e_2$	e_3	e_1	-1

split=1

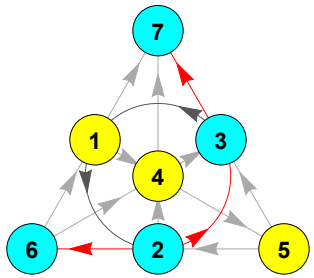
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	5	-4	-7	6
2	-3	-1	1	7	-6	5	-4
3	2	-1	-1	-6	-7	4	5
4	-5	-7	6	1	-1	3	-2
5	4	6	7	1	1	2	3
6	7	-5	-4	-3	-2	1	1
7	-6	4	-5	2	-3	-1	1

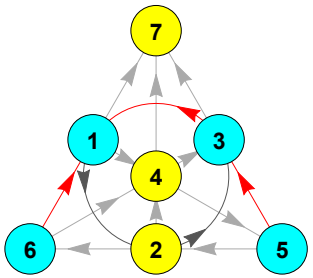
split=2

Fano plane



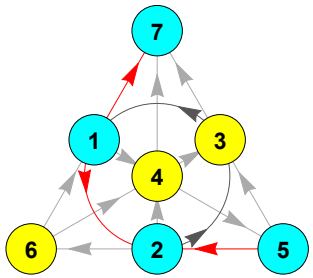
split=4

Fano plane



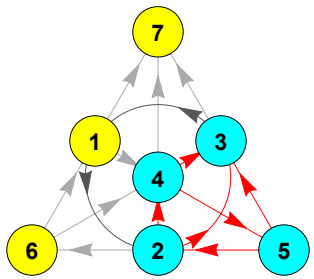
split=6

Fano plane



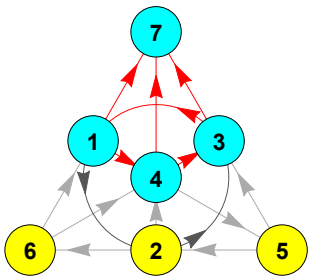
split=3

Fano plane



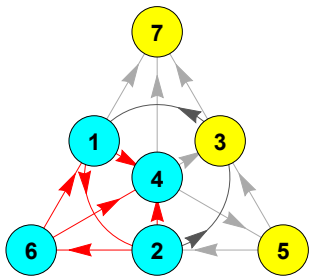
split=5

Fano plane



split=7

Fano plane

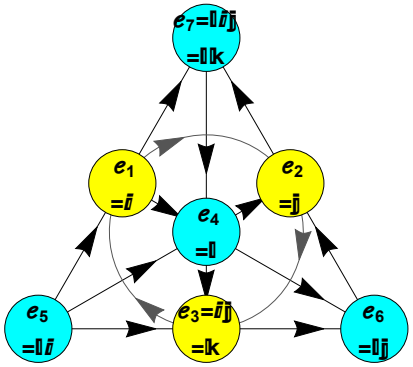


Seq ⌗	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele ⌗
171	$\overline{\Phi_{X_2}}^{0\mapsto -1/3}_{c_d}$		0apggsscc 010000010_2	Bn{ E8{	1 0	1 0	1 0	0 0	0 1	1 0	1 −1	0 0	} }	F 9

flip=False

{1, 2, 3}{1, 4, 6}{1, 7, 5}{2, 5, 4}{2, 7, 6}{3, 7, 4}{3, 6, 5}

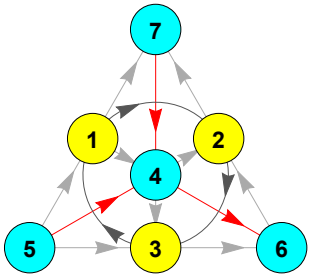
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	e_6	$-e_7$	$-e_4$	e_5
e_2	$-e_3$	−1	e_1	$-e_5$	e_4	$-e_7$	e_6
e_3	e_2	$-e_1$	−1	$-e_7$	$-e_6$	e_5	e_4
e_4	$-e_6$	e_5	e_7	−1	$-e_2$	e_1	$-e_3$
e_5	e_7	$-e_4$	e_6	e_2	−1	$-e_3$	$-e_1$
e_6	e_4	e_7	$-e_5$	$-e_1$	e_3	−1	$-e_2$
e_7	$-e_5$	$-e_6$	$-e_4$	e_3	e_1	e_2	−1

split=1

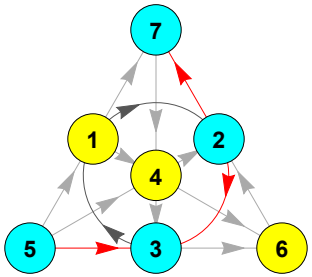
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	6	−7	−4	5
2	−3	−1	1	−5	4	−7	6
3	2	−1	−1	−7	−6	5	4
4	−6	5	7	1	2	−1	3
5	7	−4	6	−2	1	3	1
6	4	7	−5	1	−3	1	2
7	−5	−6	−4	−3	−1	−2	1

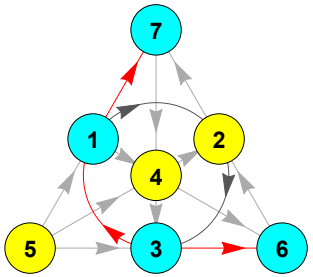
split=2

Fano plane



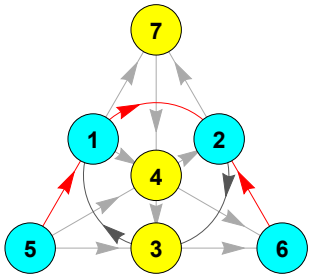
split=4

Fano plane



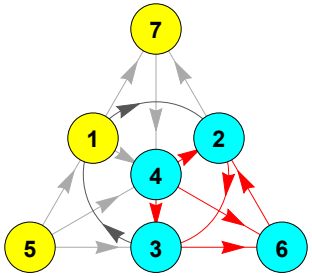
split=6

Fano plane



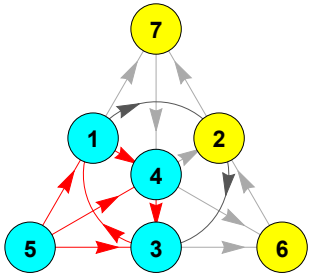
split=3

Fano plane



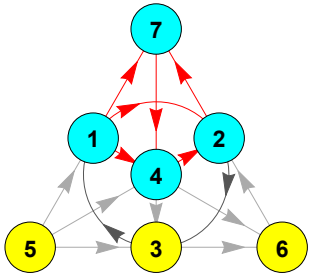
split=5

Fano plane



split=7

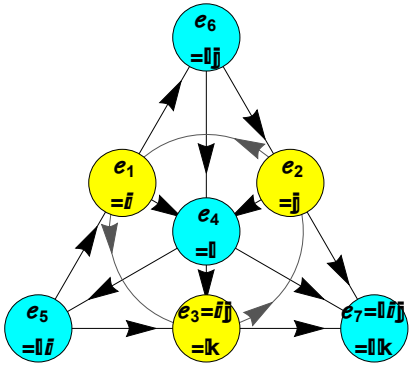
Fano plane



flip=True

{1, 3, 2}{1, 4, 7}{1, 6, 5}{2, 4, 5}{2, 7, 6}{3, 6, 4}{3, 7, 5}

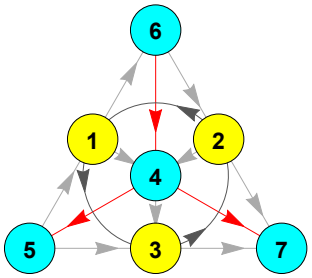
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	e_7	$-e_6$	e_5	$-e_4$
e_2	e_3	−1	$-e_1$	e_5	$-e_4$	$-e_7$	e_6
e_3	$-e_2$	e_1	−1	$-e_6$	$-e_7$	e_4	e_5
e_4	$-e_7$	$-e_5$	e_6	−1	e_2	$-e_3$	e_1
e_5	e_6	e_4	e_7	$-e_2$	−1	$-e_1$	$-e_3$
e_6	$-e_5$	e_7	$-e_4$	e_3	e_1	−1	$-e_2$
e_7	e_4	$-e_6$	$-e_5$	$-e_1$	e_3	e_2	−1

split=1

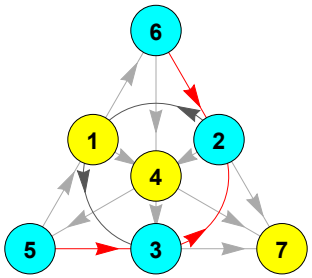
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	7	−6	5	−4
2	3	−1	−1	5	−4	−7	6
3	−2	1	−1	−6	−7	4	5
4	−7	−5	6	1	−2	3	−1
5	6	4	7	2	1	1	3
6	−5	7	−4	−3	−1	1	2
7	4	−6	−5	1	−3	−2	1

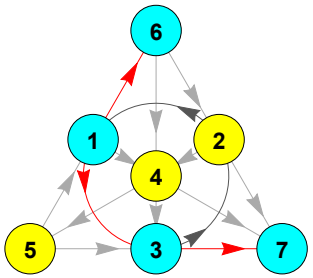
split=2

Fano plane



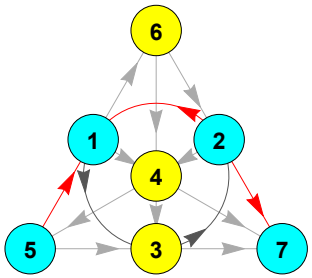
split=4

Fano plane



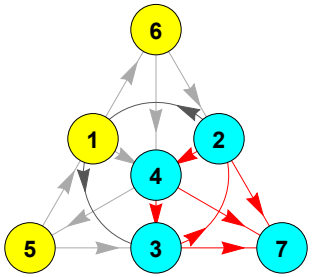
split=6

Fano plane



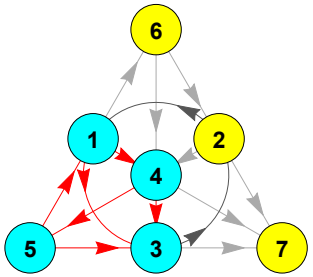
split=3

Fano plane



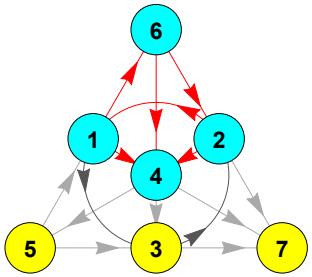
split=5

Fano plane



split=7

Fano plane

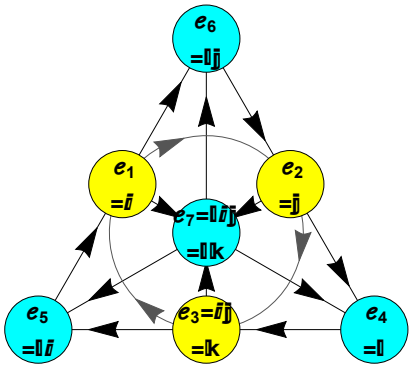


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
172	$\overline{\Phi x_3}^{\,0\mapsto -1/3}_{m_d}$		0apggsscc	Bn{	1	1	1	0	0	1	0	1	}	Lv
			010000011_2	E8{	0	0	0	0	1	0	0	-1	}	116

flip=False

{1, 2, 3}{1, 7, 4}{1, 6, 5}{2, 4, 6}{2, 7, 5}{3, 5, 4}{3, 7, 6}

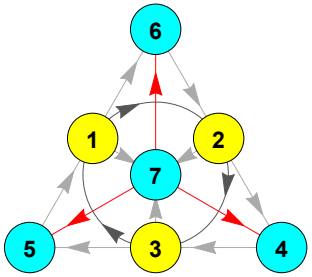
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	$-e_7$	$-e_6$	e_5	e_4
e_2	$-e_3$	-1	e_1	e_6	$-e_7$	$-e_4$	e_5
e_3	e_2	$-e_1$	-1	$-e_5$	e_4	$-e_7$	e_6
e_4	e_7	$-e_6$	e_5	-1	$-e_3$	e_2	$-e_1$
e_5	e_6	e_7	$-e_4$	e_3	-1	$-e_1$	$-e_2$
e_6	$-e_5$	e_4	e_7	$-e_2$	e_1	-1	$-e_3$
e_7	$-e_4$	$-e_5$	$-e_6$	e_1	e_2	e_3	-1

split=1

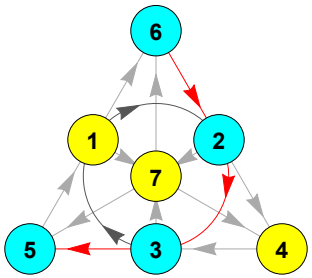
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	-7	-6	5	4
2	-3	-1	1	6	-7	-4	5
3	2	-1	-1	-5	4	-7	6
4	7	-6	5	1	3	-2	1
5	6	7	-4	-3	1	1	2
6	-5	4	7	2	-1	1	3
7	-4	-5	-6	-1	-2	-3	1

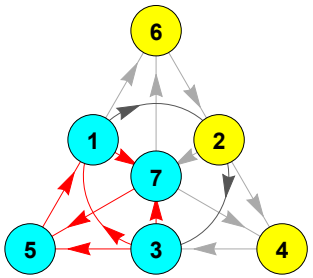
split=2

Fano plane



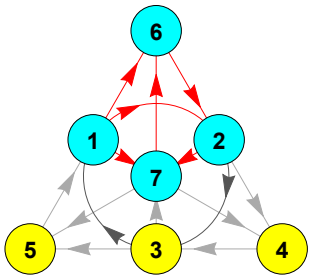
split=4

Fano plane



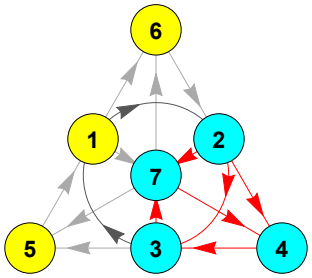
split=6

Fano plane



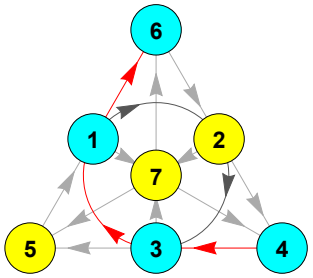
split=3

Fano plane



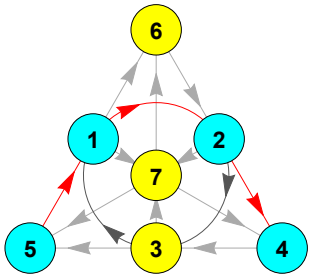
split=5

Fano plane



split=7

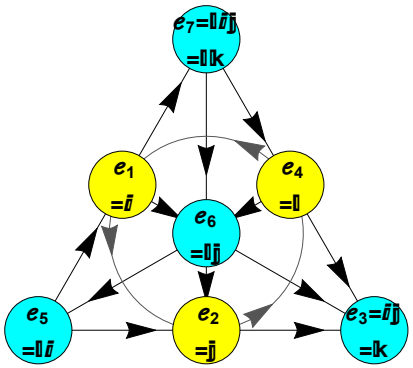
Fano plane



flip=True

{1, 2, 4}{1, 6, 3}{1, 7, 5}{2, 3, 5}{2, 7, 6}{3, 7, 4}{4, 6, 5}

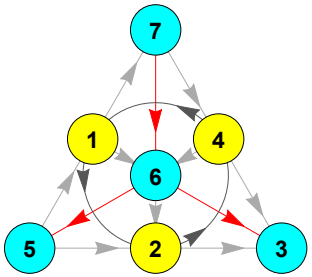
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_4	$-e_6$	$-e_2$	$-e_7$	e_3	e_5
e_2	$-e_4$	-1	e_5	e_1	$-e_3$	$-e_7$	e_6
e_3	e_6	$-e_5$	-1	$-e_7$	e_2	$-e_1$	e_4
e_4	e_2	$-e_1$	e_7	-1	$-e_6$	e_5	$-e_3$
e_5	e_7	e_3	$-e_2$	e_6	-1	$-e_4$	$-e_1$
e_6	$-e_3$	e_7	e_1	$-e_5$	e_4	-1	$-e_2$
e_7	$-e_5$	$-e_6$	$-e_4$	e_3	e_1	e_2	-1

split=1

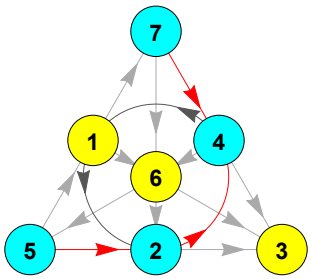
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	4	-6	-2	-7	3	5
2	-4	-1	5	1	-3	-7	6
3	6	-5	1	-7	-2	1	-4
4	2	-1	7	-1	-6	5	-3
5	7	3	2	6	1	4	1
6	-3	7	-1	-5	-4	1	2
7	-5	-6	4	3	-1	-2	1

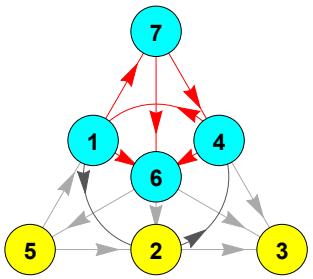
split=2

Fano plane



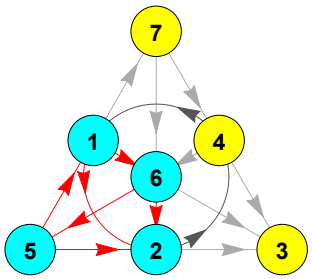
split=4

Fano plane



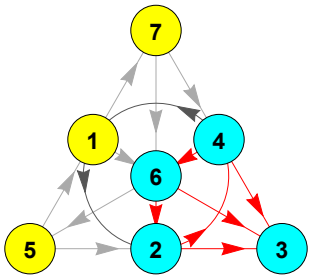
split=6

Fano plane



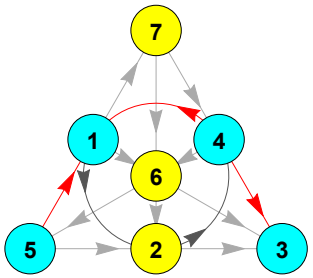
split=3

Fano plane



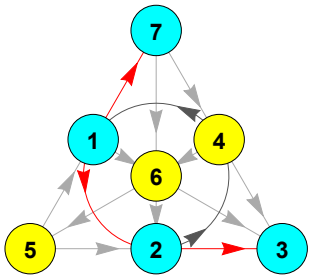
split=5

Fano plane



split=7

Fano plane

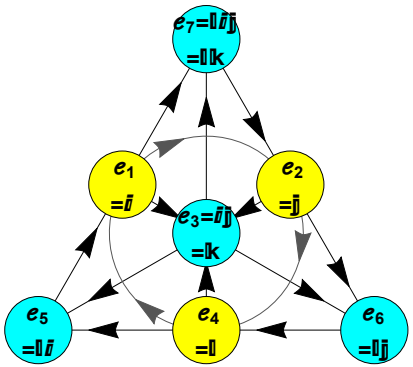


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
173	Φx_3 $\frac{0\mapsto 1/3}{\mathbb{L}}$		0apggsscc	Bn{	1	1	1	0	0	0	1	1	}	$\overline{Ds}$
			000001011_2	E8{	0	0	0	0	1	0	0	1	}	110

flip=False

{1, 2, 4}{1, 3, 6}{1, 7, 5}{2, 3, 5}{2, 6, 7}{3, 7, 4}{4, 5, 6}

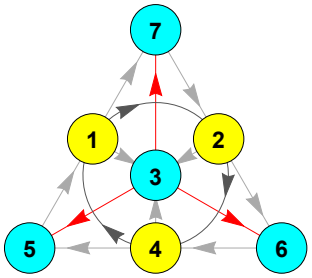
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	e_6	$-e_2$	$-e_7$	$-e_3$	e_5
e_2	e_2	$-e_4$	−1	e_5	e_1	$-e_3$	e_7	$-e_6$
e_3	e_3	$-e_6$	$-e_5$	−1	$-e_7$	e_2	e_1	e_4
e_4	e_4	e_2	$-e_1$	e_7	−1	e_6	$-e_5$	$-e_3$
e_5	e_5	e_7	e_3	$-e_2$	$-e_6$	−1	e_4	$-e_1$
e_6	e_6	e_3	$-e_7$	$-e_1$	e_5	$-e_4$	−1	e_2
e_7	e_7	$-e_5$	e_6	$-e_4$	e_3	e_1	$-e_2$	−1

split=1

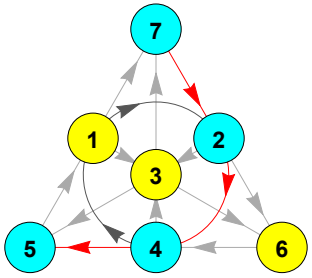
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	6	−2	−7	−3	5
2	−4	−1	5	1	−3	7	−6
3	−6	−5	1	−7	−2	−1	−4
4	2	−1	7	−1	6	−5	−3
5	7	3	2	−6	1	−4	1
6	3	−7	1	5	4	1	−2
7	−5	6	4	3	−1	2	1

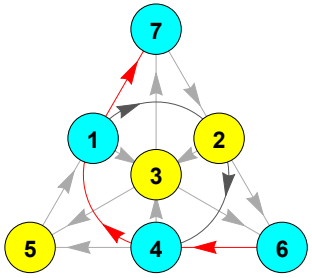
split=2

Fano plane



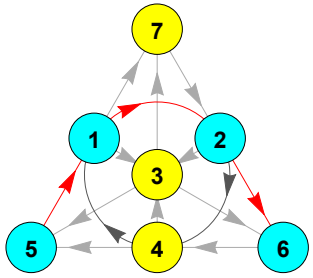
split=4

Fano plane



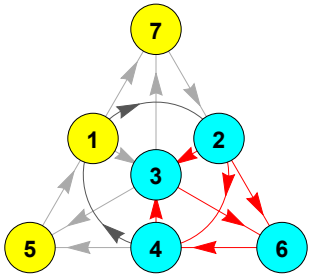
split=6

Fano plane



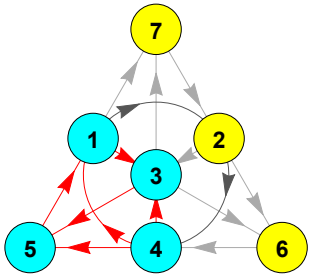
split=3

Fano plane



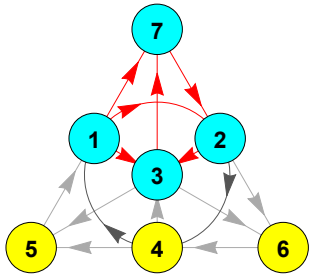
split=5

Fano plane



split=7

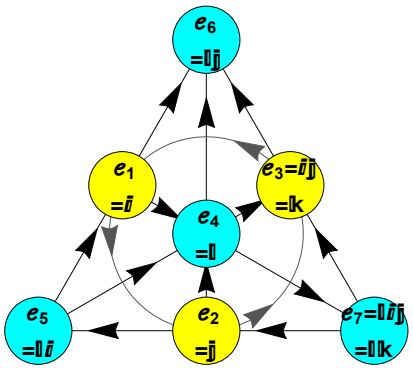
Fano plane



flip=True

{1, 2, 3}{1, 4, 7}{1, 6, 5}{2, 4, 6}{2, 5, 7}{3, 5, 4}{3, 6, 7}

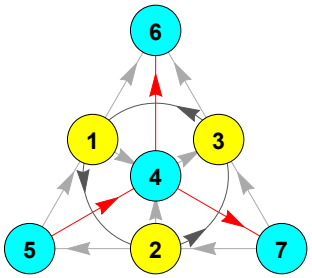
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	e_7	$-e_6$	e_5	$-e_4$
e_2	e_2	$-e_3$	−1	e_1	e_6	e_7	$-e_4$	$-e_5$
e_3	e_3	e_2	$-e_1$	−1	$-e_5$	e_4	e_7	$-e_6$
e_4	e_4	$-e_7$	$-e_6$	e_5	−1	$-e_3$	e_2	e_1
e_5	e_5	e_6	$-e_7$	$-e_4$	e_3	−1	$-e_1$	e_2
e_6	e_6	$-e_5$	e_4	$-e_7$	$-e_2$	e_1	−1	e_3
e_7	e_7	e_4	e_5	e_6	$-e_1$	$-e_2$	$-e_3$	−1

split=1

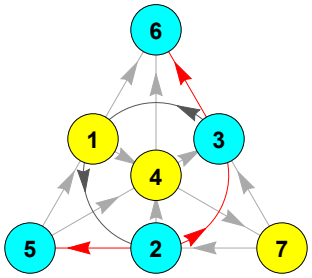
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	7	−6	5	−4
2	−3	−1	1	6	7	−4	−5
3	2	−1	−1	−5	4	7	−6
4	−7	−6	5	1	3	−2	−1
5	6	−7	−4	−3	1	1	−2
6	−5	4	−7	2	−1	1	−3
7	4	5	6	1	2	3	1

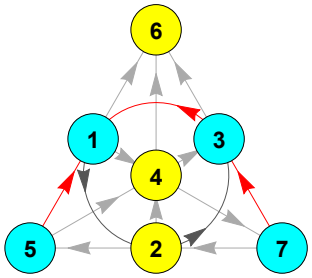
split=2

Fano plane



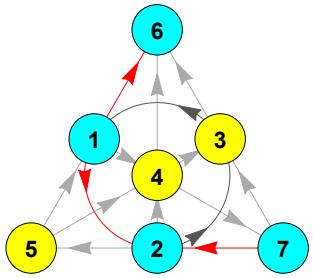
split=4

Fano plane



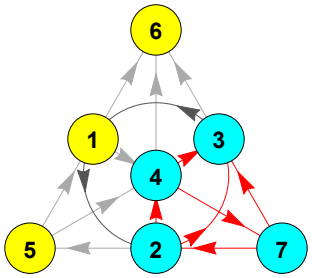
split=6

Fano plane



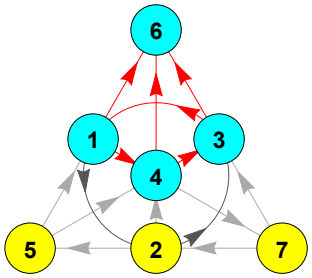
split=3

Fano plane



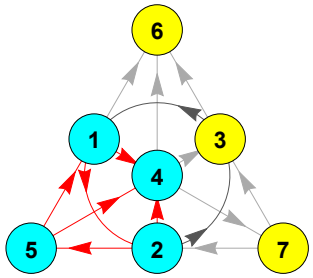
split=5

Fano plane



split=7

Fano plane

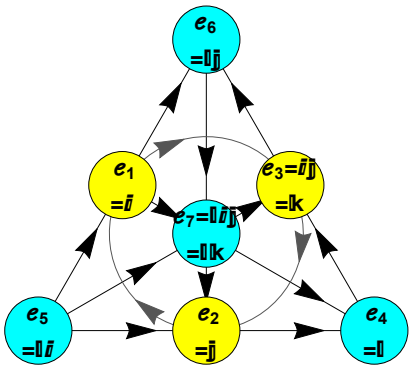


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
174	$\Phi_{X_2}^{0\to 1/3}$		0apggsscc	Bn{	1	1	0	1	1	1	0	0	}	Ne
			000001010_2	E8{	0	0	0	0	1	0	1	0	}	10

flip=False

{1, 3, 2}{1, 7, 4}{1, 6, 5}{2, 4, 5}{2, 6, 7}{3, 6, 4}{3, 5, 7}

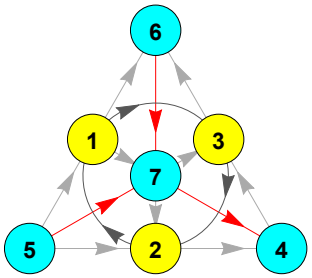
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_3$	e_2	$-e_7$	$-e_6$	e_5	e_4
e_2	e_3	$-e_3$	−1	$-e_1$	e_5	$-e_4$	e_7	$-e_6$
e_3	$-e_2$	e_1	−1	$-e_6$	e_7	e_4	$-e_5$	
e_4	e_7	$-e_5$	e_6	−1	e_2	$-e_3$	$-e_1$	
e_5	e_6	e_4	$-e_7$	$-e_2$	−1	$-e_1$	e_3	
e_6	$-e_5$	$-e_7$	$-e_4$	e_3	e_1	−1	e_2	
e_7	$-e_4$	e_6	e_5	e_1	$-e_3$	$-e_2$	−1	

split=1

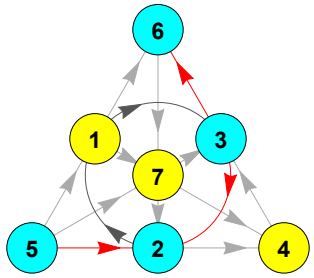
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−7	−6	5	4
2	3	−1	−1	5	−4	7	−6
3	−2	1	−1	−6	7	4	−5
4	7	−5	6	1	−2	3	1
5	6	4	−7	2	1	1	−3
6	−5	−7	−4	−3	−1	1	−2
7	−4	6	5	−1	3	2	1

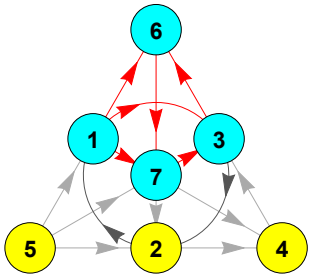
split=2

Fano plane



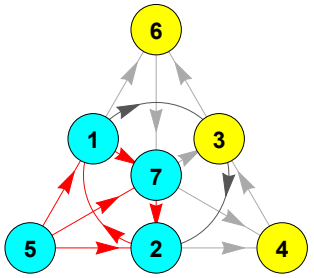
split=4

Fano plane



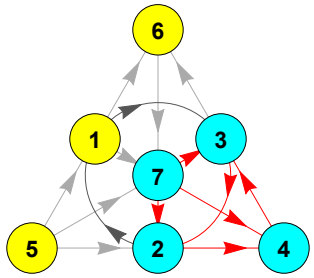
split=6

Fano plane



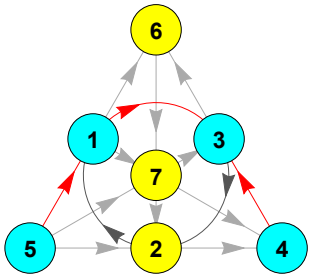
split=3

Fano plane



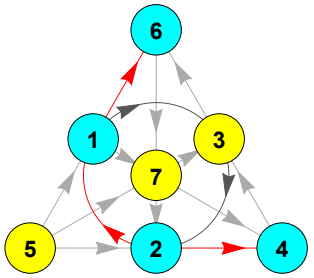
split=5

Fano plane



split=7

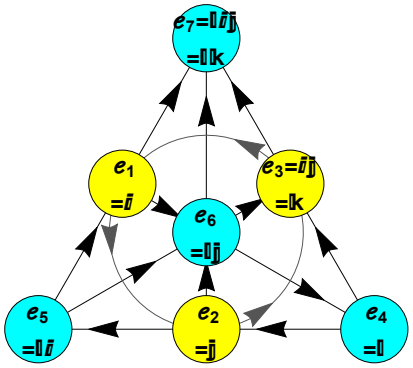
Fano plane



flip=True

{1, 2, 3}{1, 6, 4}{1, 7, 5}{2, 5, 4}{2, 6, 7}{3, 7, 4}{3, 5, 6}

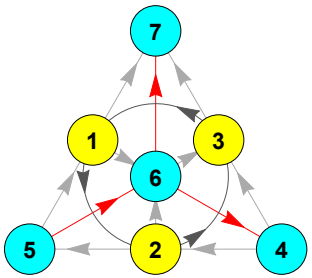
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	$-e_6$	$-e_7$	e_4	e_5
e_2	$-e_3$	−1	e_1	$-e_5$	e_4	e_7	$-e_6$	
e_3	e_2	$-e_1$	−1	$-e_7$	e_6	$-e_5$	e_4	
e_4	e_6	e_5	e_7	−1	$-e_2$	$-e_1$	$-e_3$	
e_5	e_7	$-e_4$	$-e_6$	e_2	−1	e_3	$-e_1$	
e_6	$-e_4$	$-e_7$	e_5	e_1	$-e_3$	−1	e_2	
e_7	$-e_5$	e_6	$-e_4$	e_3	e_1	$-e_2$	−1	

split=1

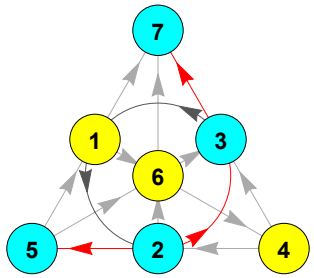
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−6	−7	4	5
2	−3	−1	1	−5	4	7	−6
3	2	−1	−1	−7	6	−5	4
4	6	5	7	1	2	1	3
5	7	−4	−6	−2	1	−3	1
6	−4	−7	5	−1	3	1	−2
7	−5	6	−4	−3	−1	2	1

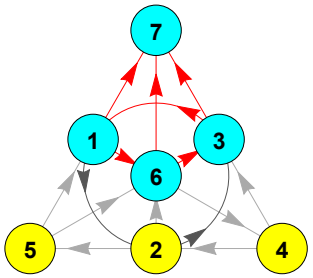
split=2

Fano plane



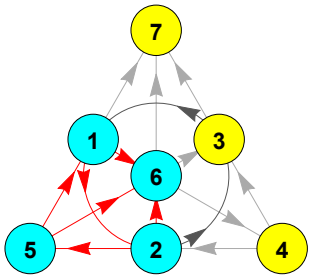
split=4

Fano plane



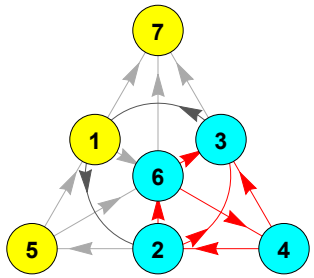
split=6

Fano plane



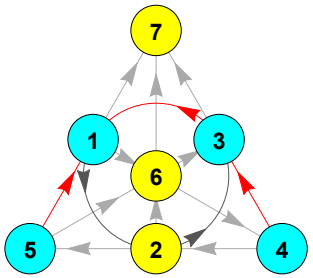
split=3

Fano plane



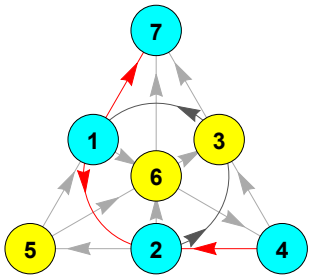
split=5

Fano plane



split=7

Fano plane

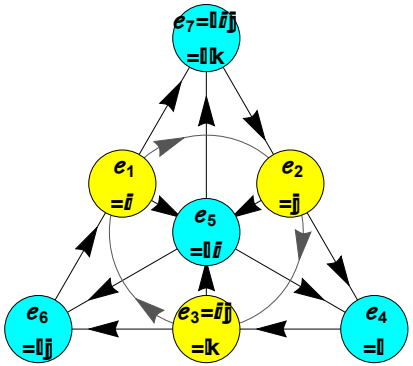


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
175	$\Phi_{\substack{X_1 \\ Om}}^{0\to 1/3}$		0apggsscc 000001001$_2$	Bn{ E8{	1 0	1 0	0 0	1 0	1 1	0 1	1 0	0 0	} }	S 16

flip=False

{1, 2, 3}{1, 5, 4}{1, 7, 6}{2, 4, 7}{2, 5, 6}{3, 6, 4}{3, 5, 7}

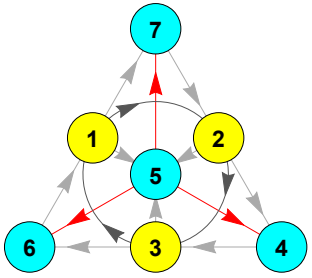
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	$-e_5$	e_4	$-e_7$	e_6
e_2	$-e_3$	−1	e_1	e_7	e_6	$-e_5$	$-e_4$
e_3	e_2	$-e_1$	−1	$-e_6$	e_7	e_4	$-e_5$
e_4	e_5	$-e_7$	e_6	−1	$-e_1$	$-e_3$	e_2
e_5	$-e_4$	$-e_6$	$-e_7$	e_1	−1	e_2	e_3
e_6	e_7	e_5	$-e_4$	e_3	$-e_2$	−1	$-e_1$
e_7	$-e_6$	e_4	e_5	$-e_2$	$-e_3$	e_1	−1

split=1

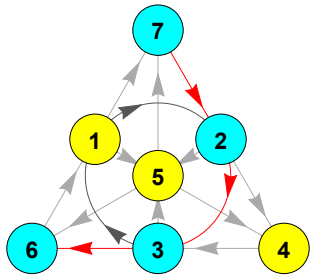
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−5	4	−7	6
2	−3	−1	1	7	6	−5	−4
3	2	−1	−1	−6	7	4	−5
4	5	−7	6	1	1	3	−2
5	−4	−6	−7	−1	1	−2	−3
6	7	5	−4	−3	2	1	1
7	−6	4	5	2	3	−1	1

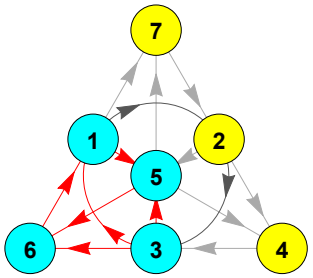
split=2

Fano plane



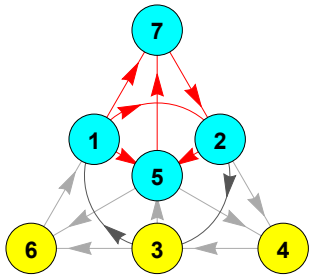
split=4

Fano plane



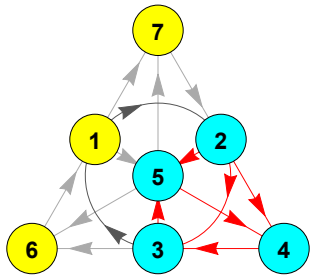
split=6

Fano plane



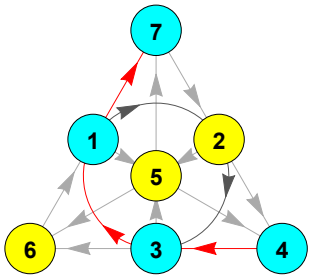
split=3

Fano plane



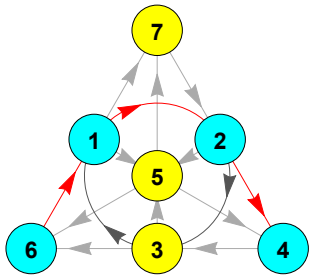
split=5

Fano plane



split=7

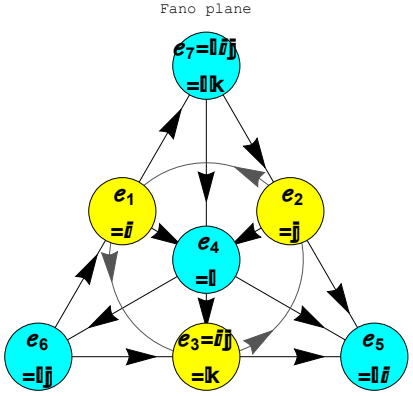
Fano plane



flip=True

{1, 3, 2}{1, 4, 5}{1, 7, 6}{2, 4, 6}{2, 5, 7}{3, 7, 4}{3, 5, 6}

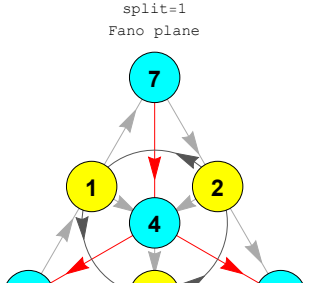
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	e_5	$-e_4$	$-e_7$	e_6
e_2	e_3	−1	$-e_1$	e_6	e_7	$-e_4$	$-e_5$
e_3	$-e_2$	e_1	−1	$-e_7$	e_6	$-e_5$	e_4
e_4	$-e_5$	$-e_6$	e_7	−1	e_1	e_2	$-e_3$
e_5	e_4	$-e_7$	$-e_6$	$-e_1$	−1	e_3	e_2
e_6	e_7	e_4	e_5	$-e_2$	$-e_3$	−1	$-e_1$
e_7	$-e_6$	e_5	$-e_4$	e_3	$-e_2$	e_1	−1

split=1

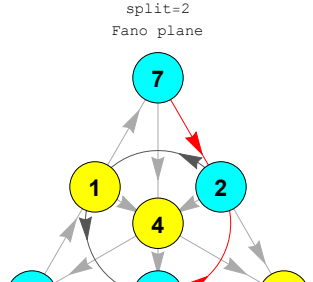
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	5	−4	−7	6
2	3	−1	−1	6	7	−4	−5
3	−2	1	−1	−7	6	−5	4
4	−5	−6	7	1	−1	−2	3
5	4	−7	−6	1	1	−3	−2
6	7	4	5	2	3	1	1
7	−6	5	−4	−3	2	−1	1

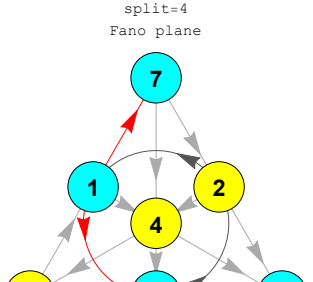
split=2

Fano plane



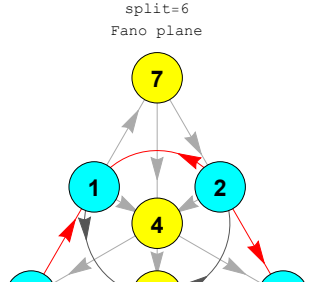
split=4

Fano plane



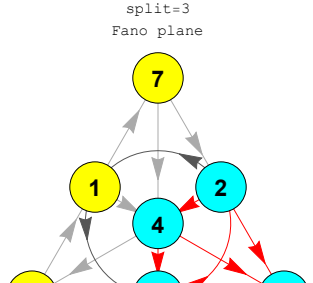
split=6

Fano plane



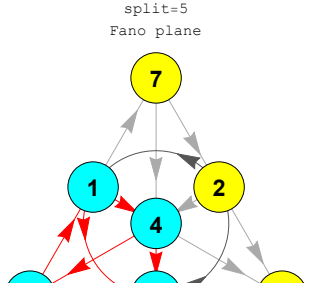
split=3

Fano plane



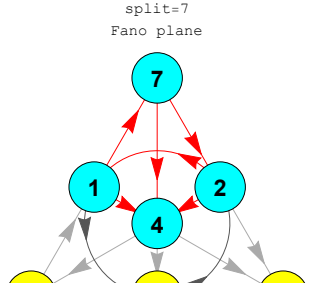
split=5

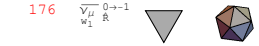
Fano plane



split=7

Fano plane

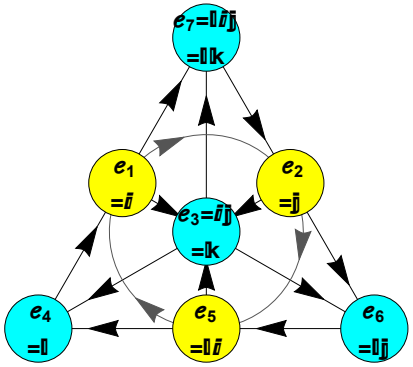


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
176	$\overline{\nu_\mu}^{\,0\to-1}_{w_1\ R}$		0apggsscc 011100100_2	Bn{ E8{	1 0	1 0	0 0	1 1	1 -1	0 0	0 0	1 0	} }	B 5

flip=False

{1, 2, 5}{1, 3, 6}{1, 7, 4}{2, 3, 4}{2, 6, 7}{3, 7, 5}{4, 6, 5}

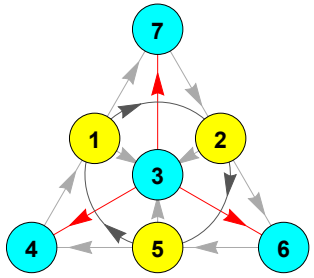
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_5	e_6	$-e_7$	$-e_2$	$-e_3$	e_4
e_2	e_2	$-e_5$	-1	e_4	$-e_3$	e_1	e_7	$-e_6$
e_3	e_3	$-e_6$	$-e_4$	-1	e_2	$-e_7$	e_1	e_5
e_4	e_4	e_7	e_3	$-e_2$	-1	$-e_6$	e_5	$-e_1$
e_5	e_5	e_2	$-e_1$	e_7	e_6	-1	$-e_4$	$-e_3$
e_6	e_6	e_3	$-e_7$	$-e_1$	$-e_5$	e_4	-1	e_2
e_7	e_7	$-e_4$	e_6	$-e_5$	e_1	e_3	$-e_2$	-1

split=1

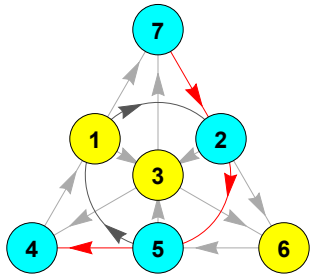
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	6	-7	-2	-3	4
2	-5	-1	4	-3	1	7	-6
3	-6	-4	1	-2	-7	-1	-5
4	7	3	2	1	-6	-5	1
5	2	-1	7	6	-1	-4	-3
6	3	-7	1	5	4	1	-2
7	-4	6	5	-1	3	2	1

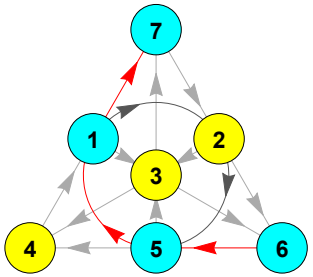
split=2

Fano plane



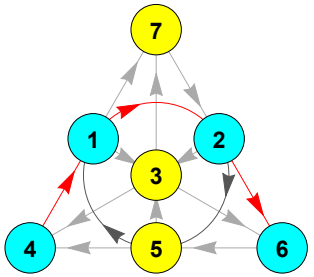
split=4

Fano plane



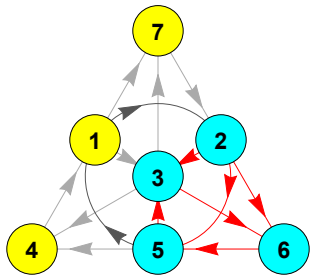
split=6

Fano plane



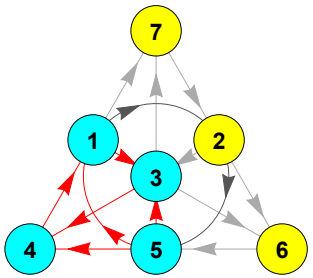
split=3

Fano plane



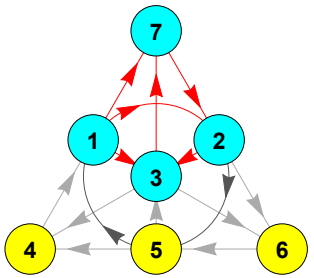
split=5

Fano plane



split=7

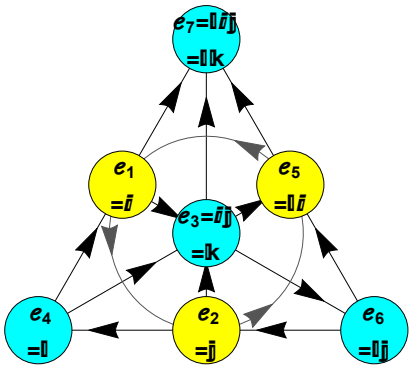
Fano plane



flip=True

{1, 2, 5}{1, 3, 6}{1, 7, 4}{2, 3, 7}{2, 4, 6}{3, 5, 4}{5, 7, 6}

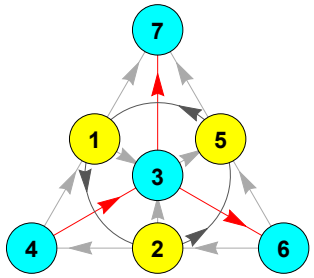
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_5	e_6	$-e_7$	$-e_2$	$-e_3$	e_4
e_2	e_2	$-e_5$	-1	e_7	e_6	e_1	$-e_4$	$-e_3$
e_3	e_3	$-e_6$	$-e_7$	-1	$-e_5$	e_4	e_1	e_2
e_4	e_4	e_7	$-e_6$	e_5	-1	$-e_3$	e_2	$-e_1$
e_5	e_5	e_2	$-e_1$	$-e_4$	e_3	-1	$-e_7$	e_6
e_6	e_6	e_3	e_4	$-e_1$	$-e_2$	e_7	-1	$-e_5$
e_7	e_7	$-e_4$	e_3	$-e_2$	e_1	$-e_6$	e_5	-1

split=1

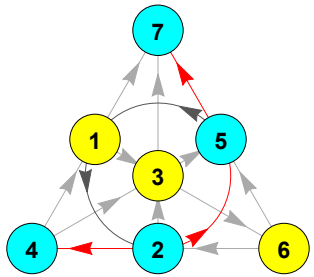
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	6	-7	-2	-3	4
2	-5	-1	7	6	1	-4	-3
3	-6	-7	1	5	4	-1	-2
4	7	-6	-5	1	-3	-2	1
5	2	-1	-4	3	-1	-7	6
6	3	4	1	2	7	1	5
7	-4	3	2	-1	-6	-5	1

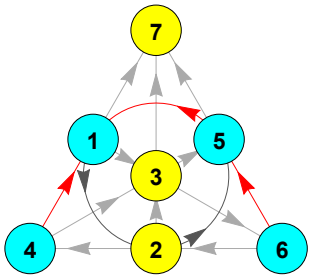
split=2

Fano plane



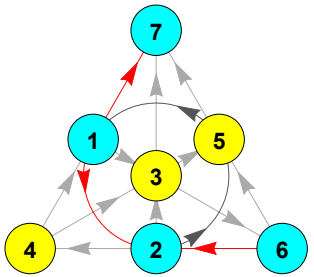
split=4

Fano plane



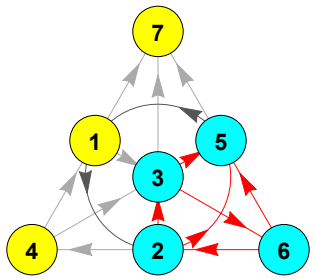
split=6

Fano plane



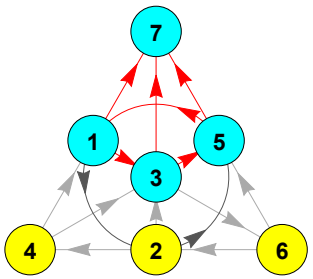
split=3

Fano plane



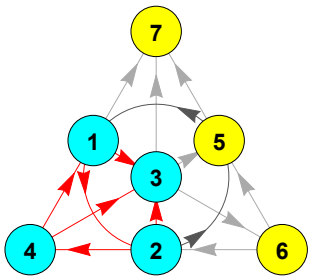
split=5

Fano plane



split=7

Fano plane

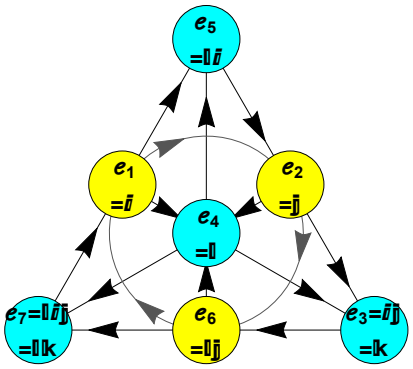


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
177	$S_{o_d}^{\vec{\gamma}\to -4/3}$		0apggsscc 000100001_2	Bn{ E8{	1 0	1 0	0 0	1 1	0 0	1 −1	1 0	0 0	} }	Mg 12

flip=False

{1, 2, 6}{1, 4, 3}{1, 5, 7}{2, 3, 5}{2, 4, 7}{3, 6, 7}{4, 5, 6}

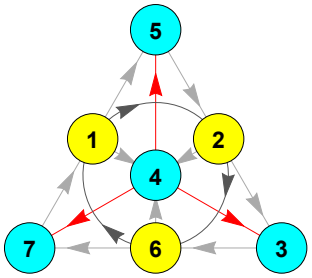
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_4$	e_3	e_7	$-e_2$	$-e_5$
e_2	$-e_6$	−1	e_5	e_7	$-e_3$	e_1	$-e_4$
e_3	e_4	$-e_5$	−1	$-e_1$	e_2	e_7	$-e_6$
e_4	$-e_3$	$-e_7$	e_1	−1	e_6	$-e_5$	e_2
e_5	$-e_7$	e_3	$-e_2$	$-e_6$	−1	e_4	e_1
e_6	e_2	$-e_1$	$-e_7$	e_5	$-e_4$	−1	e_3
e_7	e_5	e_4	e_6	$-e_2$	$-e_1$	$-e_3$	−1

split=1

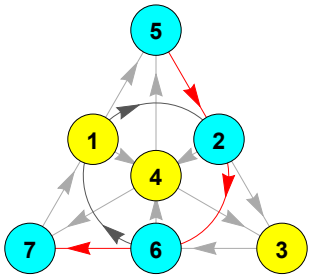
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−4	3	7	−2	−5
2	−6	−1	5	7	−3	1	−4
3	4	−5	1	1	−2	7	6
4	−3	−7	−1	1	−6	−5	−2
5	−7	3	2	6	1	4	−1
6	2	−1	−7	5	−4	−1	3
7	5	4	−6	2	1	−3	1

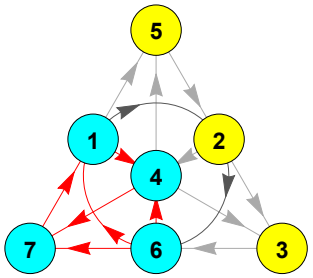
split=2

Fano plane



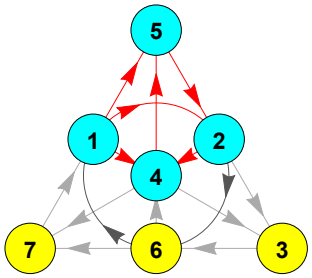
split=4

Fano plane



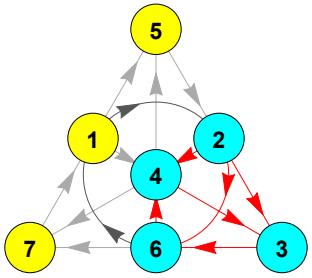
split=6

Fano plane



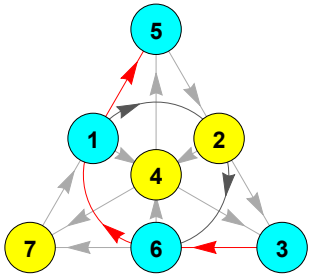
split=3

Fano plane



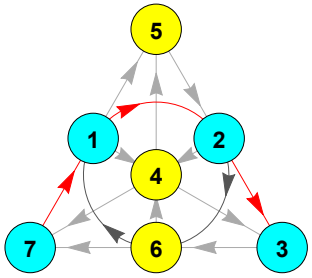
split=5

Fano plane



split=7

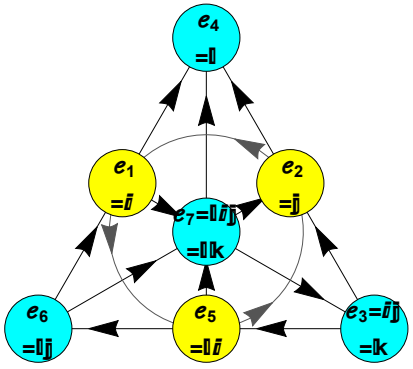
Fano plane



flip=True

{1, 5, 2}{1, 7, 3}{1, 4, 6}{2, 4, 3}{2, 6, 7}{3, 5, 6}{4, 5, 7}

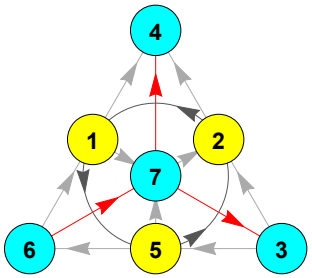
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_7$	e_6	e_2	$-e_4$	e_3
e_2	e_5	−1	$-e_4$	e_3	$-e_1$	e_7	$-e_6$
e_3	e_7	e_4	−1	$-e_2$	e_6	$-e_5$	$-e_1$
e_4	$-e_6$	$-e_3$	e_2	−1	e_7	e_1	$-e_5$
e_5	$-e_2$	e_1	$-e_6$	$-e_7$	−1	e_3	e_4
e_6	e_4	$-e_7$	e_5	$-e_1$	$-e_3$	−1	e_2
e_7	$-e_3$	e_6	e_1	e_5	$-e_4$	$-e_2$	−1

split=1

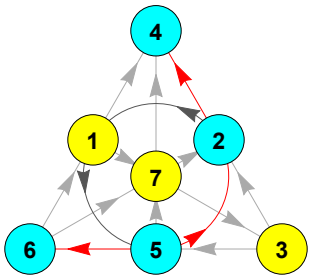
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−7	6	2	−4	3
2	5	−1	−4	3	−1	7	−6
3	7	4	1	2	6	5	1
4	−6	−3	−2	1	7	−1	5
5	−2	1	−6	−7	−1	3	4
6	4	−7	−5	1	−3	1	−2
7	−3	6	−1	−5	−4	2	1

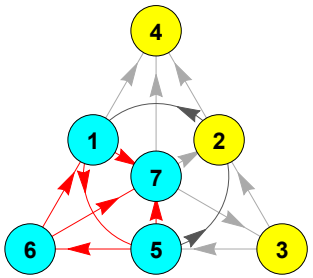
split=2

Fano plane



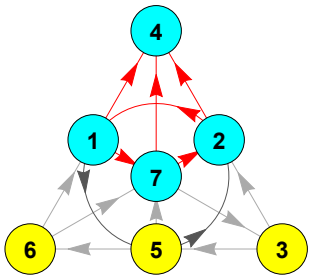
split=4

Fano plane



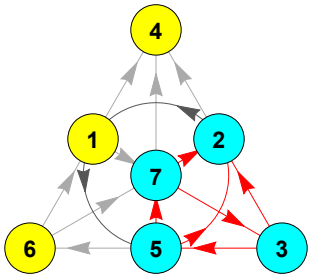
split=6

Fano plane



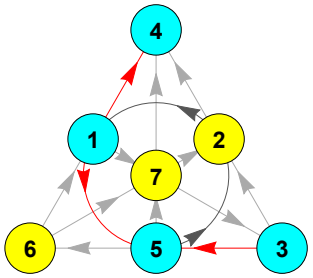
split=3

Fano plane



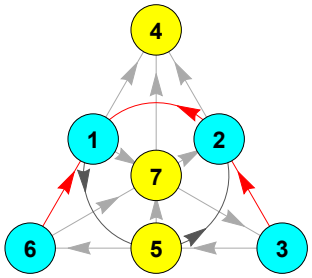
split=5

Fano plane



split=7

Fano plane

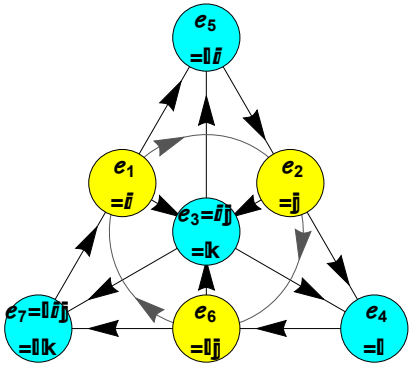


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
178	$s_{c_d}\ L^{-4/3}$		0apggsscc	Bn{	1	1	0	1	0	1	0	1	}	Ar
			00010001_0	E8{	0	0	0	1	0	0	-1	0	}	18

flip=False

{1, 2, 6}{1, 3, 4}{1, 5, 7}{2, 3, 7}{2, 4, 5}{3, 5, 6}{4, 6, 7}

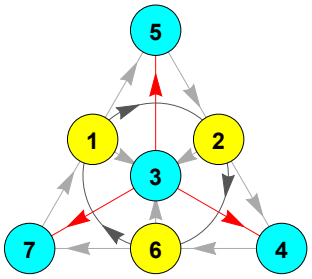
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	e_4	$-e_3$	e_7	$-e_2$	$-e_5$
e_2	$-e_6$	-1	e_7	e_5	$-e_4$	e_1	$-e_3$
e_3	$-e_4$	$-e_7$	-1	e_1	e_6	$-e_5$	e_2
e_4	e_3	$-e_5$	$-e_1$	-1	e_2	e_7	$-e_6$
e_5	$-e_7$	e_4	$-e_6$	$-e_2$	-1	e_3	e_1
e_6	e_2	$-e_1$	e_5	$-e_7$	$-e_3$	-1	e_4
e_7	e_5	e_3	$-e_2$	e_6	$-e_1$	$-e_4$	-1

split=1

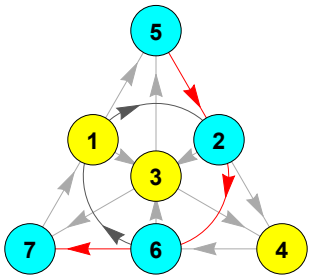
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	4	-3	7	-2	-5
2	-6	-1	7	5	-4	1	-3
3	-4	-7	1	-1	-6	-5	-2
4	3	-5	1	1	-2	7	6
5	-7	4	6	2	1	3	-1
6	2	-1	5	-7	-3	-1	4
7	5	3	2	-6	1	-4	1

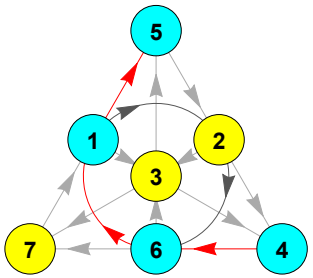
split=2

Fano plane



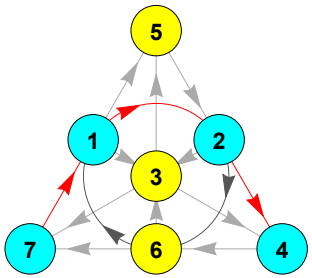
split=4

Fano plane



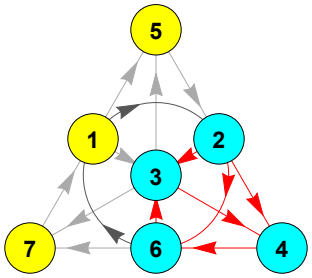
split=6

Fano plane



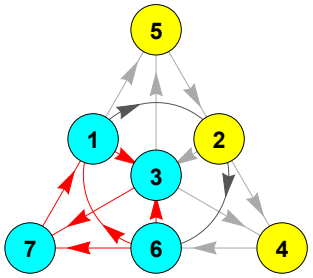
split=3

Fano plane



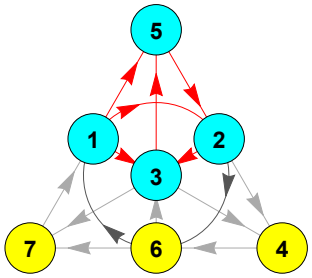
split=5

Fano plane



split=7

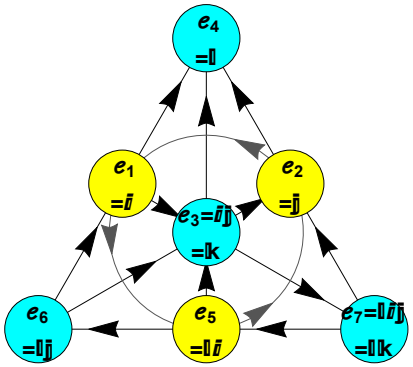
Fano plane



flip=True

{1, 5, 2}{1, 3, 7}{1, 4, 6}{2, 6, 3}{2, 4, 7}{3, 4, 5}{5, 6, 7}

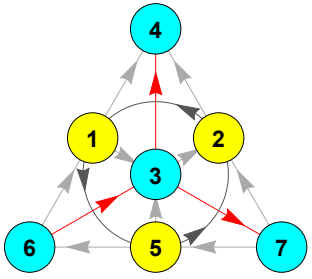
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_5$	e_7	e_6	e_2	$-e_4$	$-e_3$
e_2	e_5	-1	$-e_6$	e_7	$-e_1$	e_3	$-e_4$
e_3	$-e_7$	e_6	-1	e_5	$-e_4$	$-e_2$	e_1
e_4	$-e_6$	$-e_7$	$-e_5$	-1	e_3	e_1	e_2
e_5	$-e_2$	e_1	e_4	$-e_3$	-1	e_7	$-e_6$
e_6	e_4	$-e_3$	e_2	$-e_1$	$-e_7$	-1	e_5
e_7	e_3	e_4	$-e_1$	$-e_2$	e_6	$-e_5$	-1

split=1

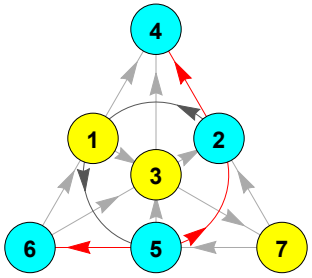
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-5	7	6	2	-4	-3
2	5	-1	-6	7	-1	3	-4
3	-7	6	1	-5	-4	2	-1
4	-6	-7	5	1	3	-1	-2
5	-2	1	4	-3	-1	7	-6
6	4	-3	-2	1	-7	1	-5
7	3	4	1	2	6	5	1

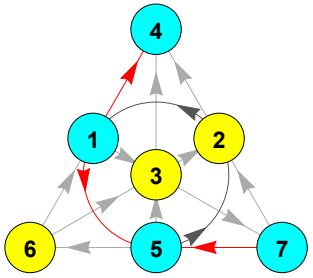
split=2

Fano plane



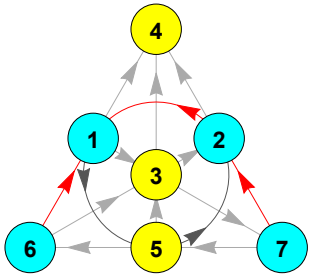
split=4

Fano plane



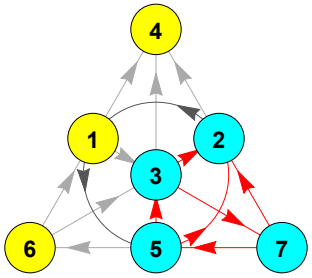
split=6

Fano plane



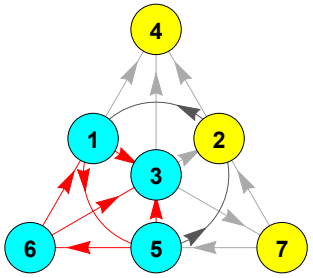
split=3

Fano plane



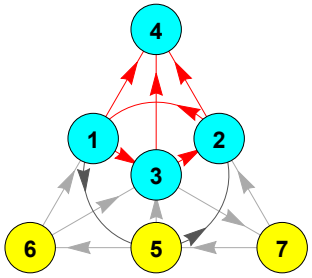
split=5

Fano plane



split=7

Fano plane

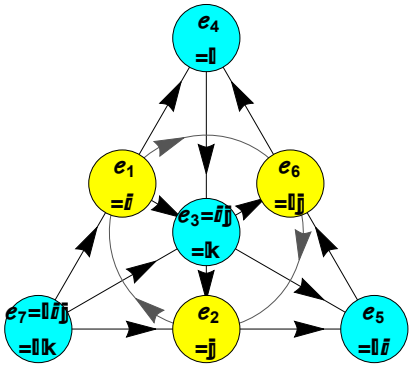


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates								Ele #
179	$s_{m_d}^{-1/3\to-4/3}$		0apggsscc	Bn{	1	1	0	1	0	0	1	1 }	Uus
			000100011_2	E8{	0	0	0	1	0	0	0	−1 }	117

flip=False

{1, 6, 2}{1, 3, 5}{1, 4, 7}{2, 4, 3}{2, 5, 7}{3, 6, 7}{4, 5, 6}

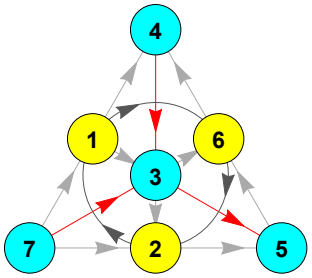
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	e_5	e_7	$-e_3$	e_2	$-e_4$
e_2	e_6	−1	$-e_4$	e_3	e_7	$-e_1$	$-e_5$	
e_3	$-e_5$	e_4	−1	$-e_2$	e_1	e_7	$-e_6$	
e_4	$-e_7$	$-e_3$	e_2	−1	e_6	$-e_5$	e_1	
e_5	e_3	$-e_7$	$-e_1$	$-e_6$	−1	e_4	e_2	
e_6	$-e_2$	e_1	$-e_7$	e_5	$-e_4$	−1	e_3	
e_7	e_4	e_5	e_6	$-e_1$	$-e_2$	$-e_3$	−1	

split=1

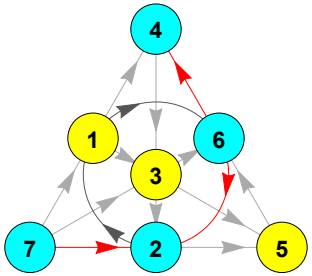
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	5	7	−3	2	−4
2	6	−1	−4	3	7	−1	−5
3	−5	4	1	2	−1	7	6
4	−7	−3	−2	1	−6	−5	−1
5	3	−7	1	6	1	4	−2
6	−2	1	−7	5	−4	−1	3
7	4	5	−6	1	2	−3	1

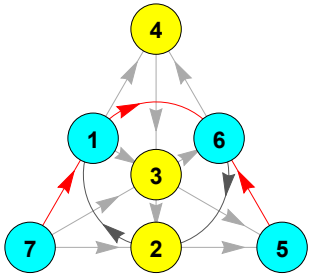
split=2

Fano plane



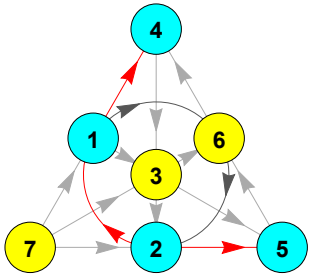
split=4

Fano plane



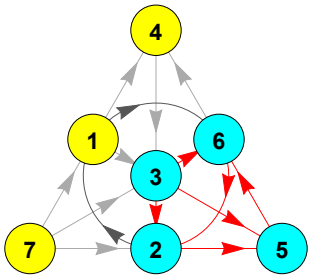
split=6

Fano plane



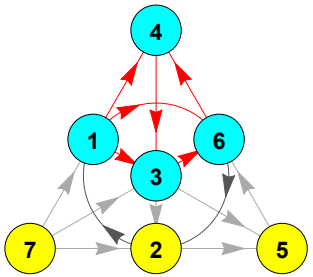
split=3

Fano plane



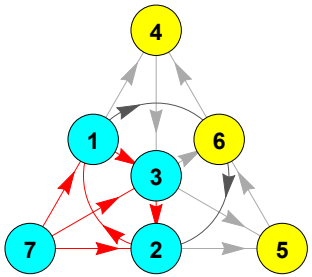
split=5

Fano plane



split=7

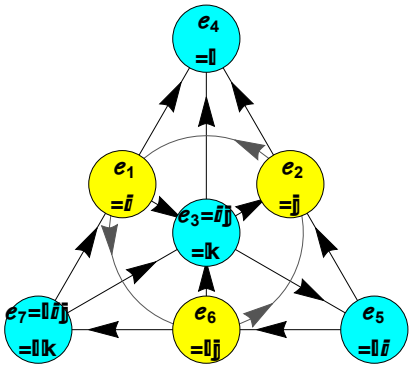
Fano plane



flip=True

{1, 6, 2}{1, 3, 5}{1, 4, 7}{2, 7, 3}{2, 4, 5}{3, 4, 6}{5, 6, 7}

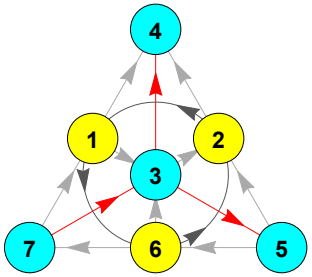
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	e_5	e_7	$-e_3$	e_2	$-e_4$
e_2	e_6	−1	$-e_7$	e_5	$-e_4$	$-e_1$	e_3	
e_3	$-e_5$	e_7	−1	e_6	e_1	$-e_4$	$-e_2$	
e_4	$-e_7$	$-e_5$	$-e_6$	−1	e_2	e_3	e_1	
e_5	e_3	e_4	$-e_1$	$-e_2$	−1	e_7	$-e_6$	
e_6	$-e_2$	e_1	e_4	$-e_3$	$-e_7$	−1	e_5	
e_7	e_4	$-e_3$	e_2	$-e_1$	e_6	$-e_5$	−1	

split=1

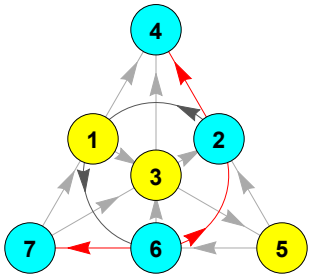
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	5	7	−3	2	−4
2	6	−1	−7	5	−4	−1	3
3	−5	7	1	−6	−1	−4	2
4	−7	−5	6	1	−2	3	−1
5	3	4	1	2	1	7	6
6	−2	1	4	−3	−7	−1	5
7	4	−3	−2	1	−6	−5	1

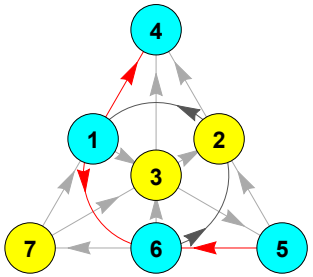
split=2

Fano plane



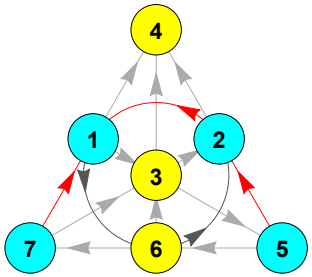
split=4

Fano plane



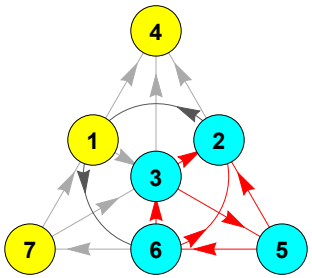
split=6

Fano plane



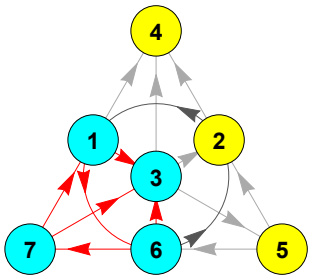
split=3

Fano plane



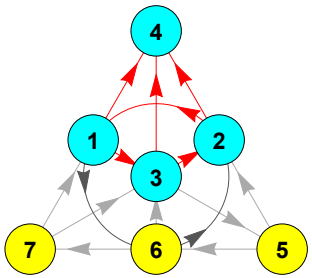
split=5

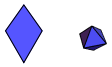
Fano plane



split=7

Fano plane

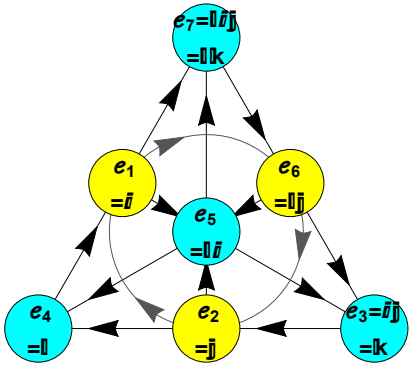


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
180	$\overline{C}_{b_1}^{-2/3}$		0apggsscc 011100111_2	Bn{ E8{	1 0	1 0	0 0	0 1	1 0	1 0	1 0	0 1	} }	$\overline{Bh}$ 107

flip=False

{1, 6, 2}{1, 5, 3}{1, 7, 4}{2, 4, 3}{2, 5, 7}{3, 7, 6}{4, 6, 5}

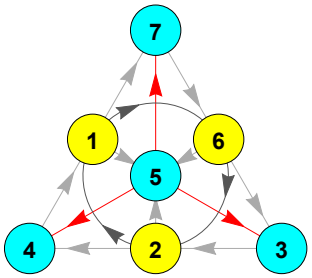
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_5$	$-e_7$	e_3	e_2	e_4
e_2	e_6	−1	$-e_4$	e_3	e_7	$-e_1$	$-e_5$
e_3	e_5	e_4	−1	$-e_2$	$-e_1$	$-e_7$	e_6
e_4	e_7	$-e_3$	e_2	−1	$-e_6$	e_5	$-e_1$
e_5	$-e_3$	$-e_7$	e_1	e_6	−1	$-e_4$	e_2
e_6	$-e_2$	e_1	e_7	$-e_5$	e_4	−1	$-e_3$
e_7	$-e_4$	e_5	$-e_6$	e_1	$-e_2$	e_3	−1

split=1

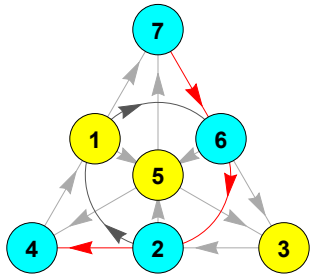
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−5	−7	3	2	4
2	6	−1	−4	3	7	−1	−5
3	5	4	1	2	1	−7	−6
4	7	−3	−2	1	6	5	1
5	−3	−7	−1	−6	1	−4	−2
6	−2	1	7	−5	4	−1	−3
7	−4	5	6	−1	2	3	1

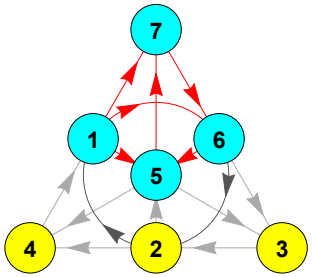
split=2

Fano plane



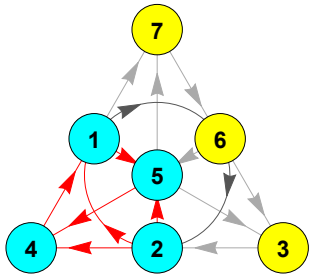
split=4

Fano plane



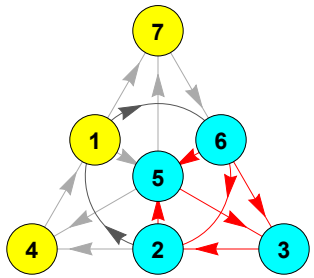
split=6

Fano plane



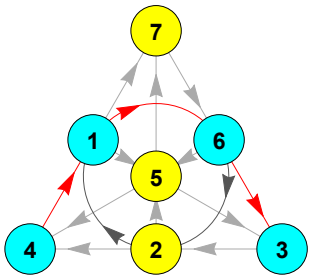
split=3

Fano plane



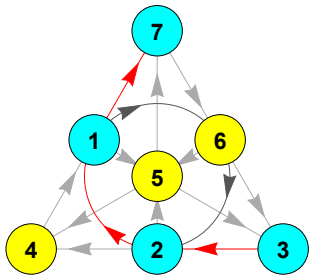
split=5

Fano plane



split=7

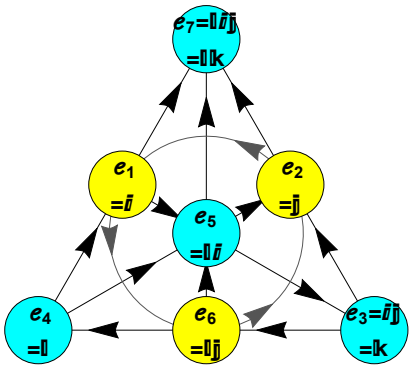
Fano plane



flip=True

{1, 6, 2}{1, 5, 3}{1, 7, 4}{2, 7, 3}{2, 4, 5}{3, 6, 4}{5, 7, 6}

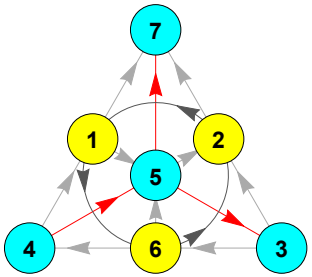
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_5$	$-e_7$	e_3	e_2	e_4
e_2	e_6	−1	$-e_7$	e_5	$-e_4$	$-e_1$	e_3
e_3	e_5	e_7	−1	$-e_6$	$-e_1$	e_4	$-e_2$
e_4	e_7	$-e_5$	e_6	−1	e_2	$-e_3$	$-e_1$
e_5	$-e_3$	e_4	e_1	$-e_2$	−1	$-e_7$	e_6
e_6	$-e_2$	e_1	$-e_4$	e_3	e_7	−1	$-e_5$
e_7	$-e_4$	$-e_3$	e_2	e_1	$-e_6$	e_5	−1

split=1

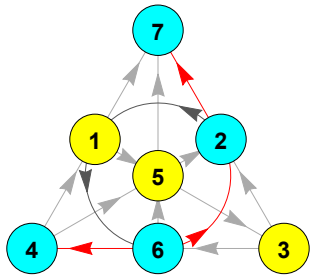
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−5	−7	3	2	4
2	6	−1	−7	5	−4	−1	3
3	5	7	1	6	1	4	2
4	7	−5	−6	1	−2	−3	1
5	−3	4	−1	2	1	−7	−6
6	−2	1	−4	3	7	−1	−5
7	−4	−3	−2	−1	6	5	1

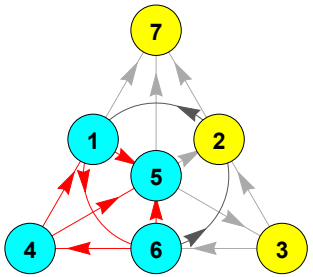
split=2

Fano plane



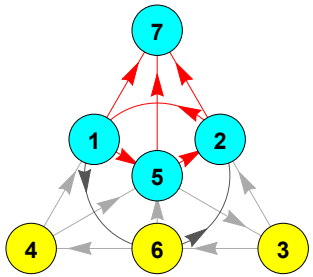
split=4

Fano plane



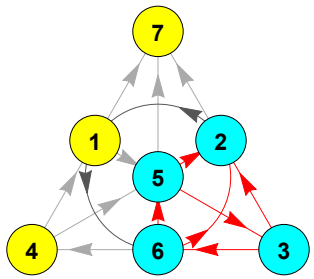
split=6

Fano plane



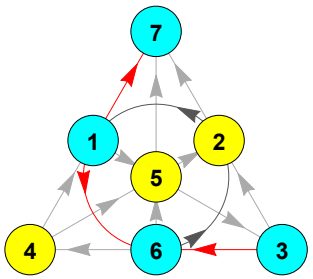
split=3

Fano plane



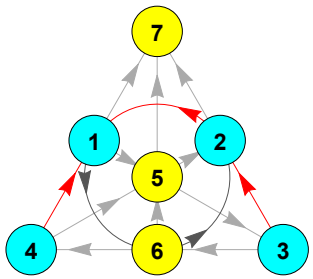
split=5

Fano plane



split=7

Fano plane

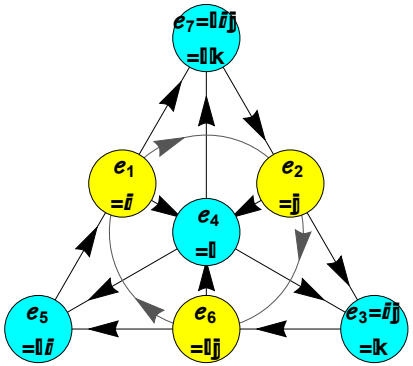


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
181	$\bar{C}_{g_1}^{0\to -2/3}$		0apggsscc	Bn{ 1 1 0 0 1 1 0 1 }	K
			$01110011 0_2$	E8{ 0 0 0 1 0 0 1 0 }	19

flip=False

{1, 2, 6}{1, 4, 3}{1, 7, 5}{2, 3, 7}{2, 4, 5}{3, 6, 5}{4, 7, 6}

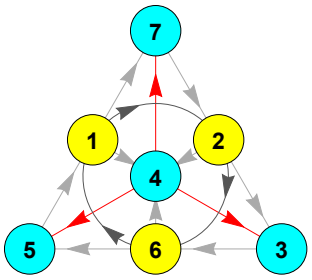
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_4$	e_3	$-e_7$	$-e_2$	e_5
e_2	$-e_6$	-1	e_7	e_5	$-e_4$	e_1	$-e_3$
e_3	e_4	$-e_7$	-1	$-e_1$	$-e_6$	e_5	e_2
e_4	$-e_3$	$-e_5$	e_1	-1	e_2	$-e_7$	e_6
e_5	e_7	e_4	e_6	$-e_2$	-1	$-e_3$	$-e_1$
e_6	e_2	$-e_1$	$-e_5$	e_7	e_3	-1	$-e_4$
e_7	$-e_5$	e_3	$-e_2$	$-e_6$	e_1	e_4	-1

split=1

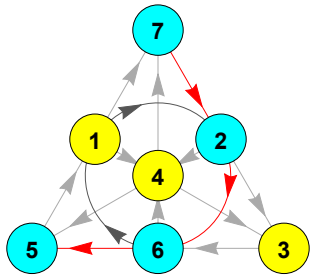
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	-4	3	-7	-2	5
2	-6	-1	7	5	-4	1	-3
3	4	-7	1	1	6	5	-2
4	-3	-5	-1	1	-2	-7	-6
5	7	4	-6	2	1	-3	1
6	2	-1	-5	7	3	-1	-4
7	-5	3	2	6	-1	4	1

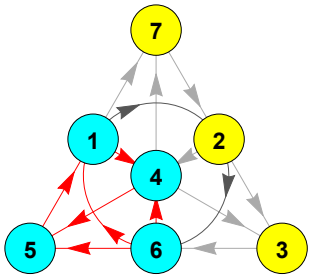
split=2

Fano plane



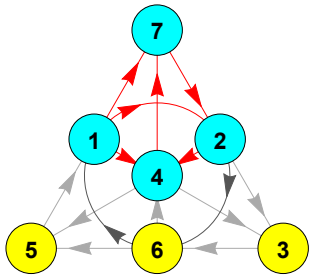
split=4

Fano plane



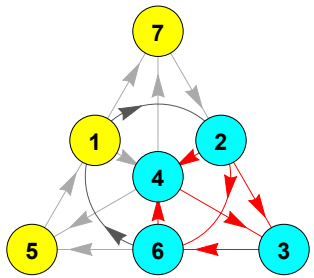
split=6

Fano plane



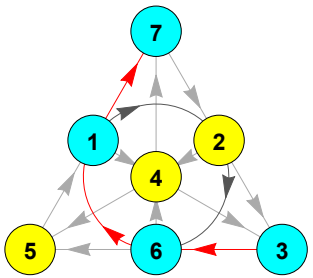
split=3

Fano plane



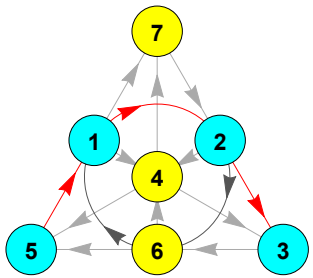
split=5

Fano plane



split=7

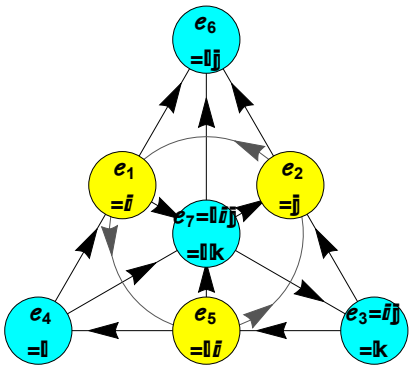
Fano plane



flip=True

{1, 5, 2}{1, 7, 3}{1, 6, 4}{2, 6, 3}{2, 4, 7}{3, 5, 4}{5, 7, 6}

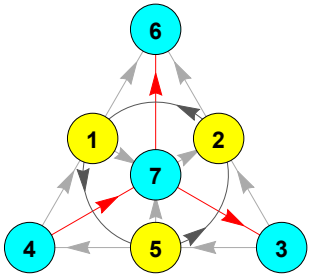
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_5$	$-e_7$	$-e_6$	e_2	e_4	e_3
e_2	e_5	-1	$-e_6$	e_7	$-e_1$	e_3	$-e_4$
e_3	e_7	e_6	-1	$-e_5$	e_4	$-e_2$	$-e_1$
e_4	e_6	$-e_7$	e_5	-1	$-e_3$	$-e_1$	e_2
e_5	$-e_2$	e_1	$-e_4$	e_3	-1	$-e_7$	e_6
e_6	$-e_4$	$-e_3$	e_2	e_1	e_7	-1	$-e_5$
e_7	$-e_3$	e_4	e_1	$-e_2$	$-e_6$	e_5	-1

split=1

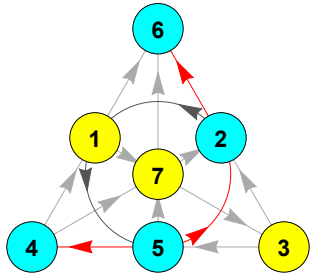
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-5	-7	-6	2	4	3
2	5	-1	-6	7	-1	3	-4
3	7	6	1	5	4	2	1
4	6	-7	-5	1	-3	1	-2
5	-2	1	-4	3	-1	-7	6
6	-4	-3	-2	-1	7	1	5
7	-3	4	-1	2	-6	-5	1

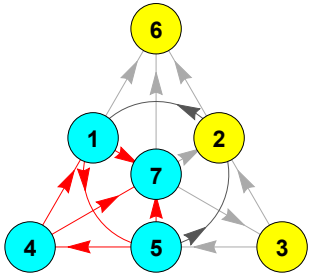
split=2

Fano plane



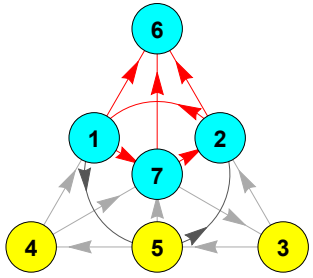
split=4

Fano plane



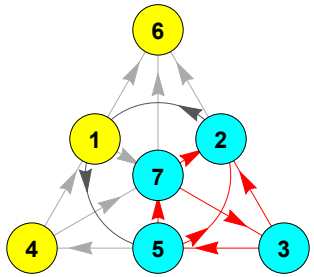
split=6

Fano plane



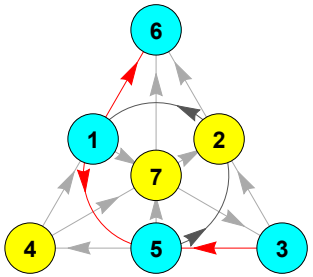
split=3

Fano plane



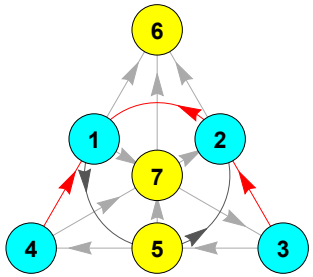
split=5

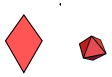
Fano plane



split=7

Fano plane

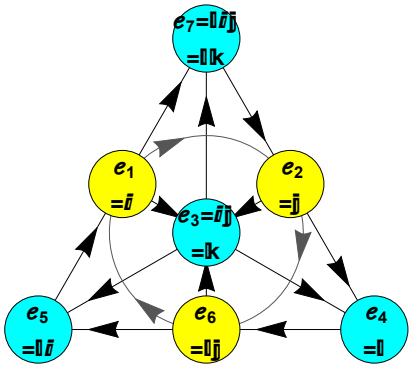


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
182	$\overline{C}_{r_1}^{0\to -2/3}$		0apggsscc 011100101_2	Bn{ E8{	1 0	1 0	0 0	0 1	1 0	0 1	1 0	1 0	} }	Cr 24

flip=False

{1, 2, 6}{1, 3, 4}{1, 7, 5}{2, 3, 5}{2, 4, 7}{3, 7, 6}{4, 6, 5}

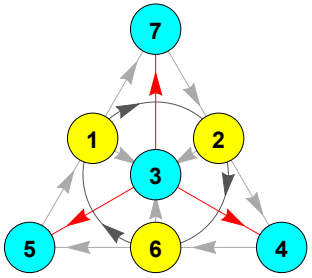
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	e_4	$-e_3$	$-e_7$	$-e_2$	e_5
e_2	$-e_6$	−1	e_5	e_7	$-e_3$	e_1	$-e_4$
e_3	$-e_4$	$-e_5$	−1	e_1	e_2	$-e_7$	e_6
e_4	e_3	$-e_7$	$-e_1$	−1	$-e_6$	e_5	e_2
e_5	e_7	e_3	$-e_2$	e_6	−1	$-e_4$	$-e_1$
e_6	e_2	$-e_1$	e_7	$-e_5$	e_4	−1	$-e_3$
e_7	$-e_5$	e_4	$-e_6$	$-e_2$	e_1	e_3	−1

split=1

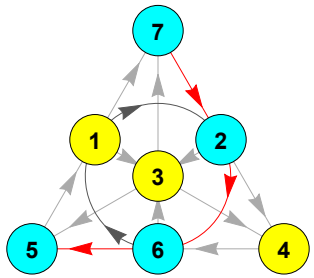
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	4	−3	−7	−2	5
2	−6	−1	5	7	−3	1	−4
3	−4	−5	1	−1	−2	−7	−6
4	3	−7	1	1	6	5	−2
5	7	3	2	−6	1	−4	1
6	2	−1	7	−5	4	−1	−3
7	−5	4	6	2	−1	3	1

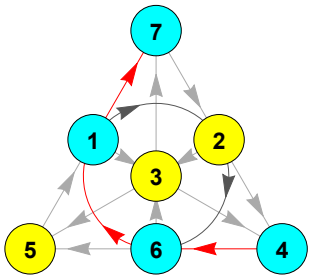
split=2

Fano plane



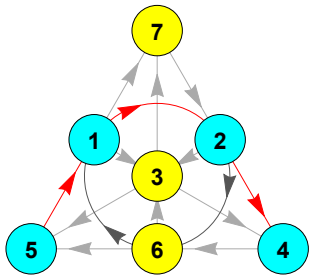
split=4

Fano plane



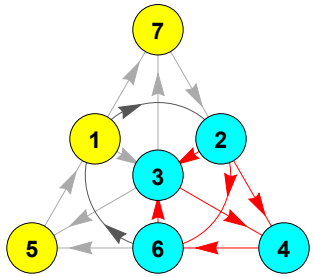
split=6

Fano plane



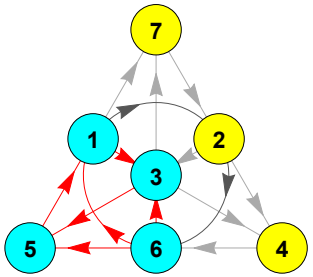
split=3

Fano plane



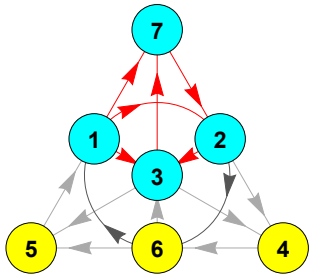
split=5

Fano plane



split=7

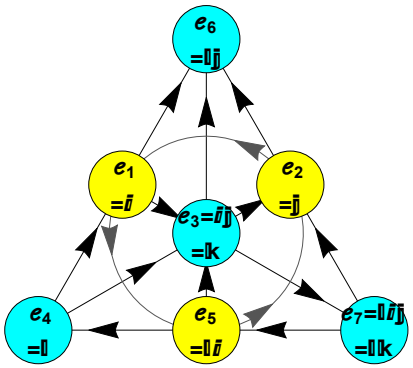
Fano plane



flip=True

{1, 5, 2}{1, 3, 7}{1, 6, 4}{2, 4, 3}{2, 6, 7}{3, 6, 5}{4, 7, 5}

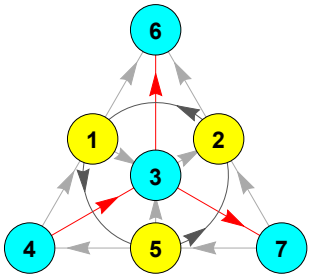
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_7	$-e_6$	e_2	e_4	$-e_3$
e_2	e_5	−1	$-e_4$	e_3	$-e_1$	e_7	$-e_6$
e_3	$-e_7$	e_4	−1	$-e_2$	$-e_6$	e_5	e_1
e_4	e_6	$-e_3$	e_2	−1	$-e_7$	$-e_1$	e_5
e_5	$-e_2$	e_1	e_6	e_7	−1	$-e_3$	$-e_4$
e_6	$-e_4$	$-e_7$	$-e_5$	e_1	e_3	−1	e_2
e_7	e_3	e_6	$-e_1$	$-e_5$	e_4	$-e_2$	−1

split=1

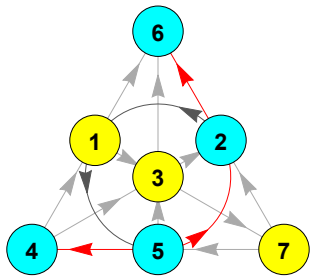
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	7	−6	2	4	−3
2	5	−1	−4	3	−1	7	−6
3	−7	4	1	2	−6	−5	−1
4	6	−3	−2	1	−7	1	−5
5	−2	1	6	7	−1	−3	−4
6	−4	−7	5	−1	3	1	−2
7	3	6	1	5	4	2	1

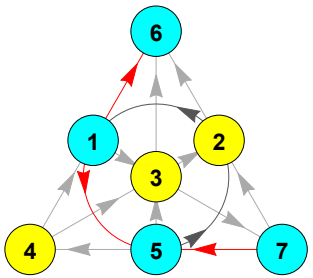
split=2

Fano plane



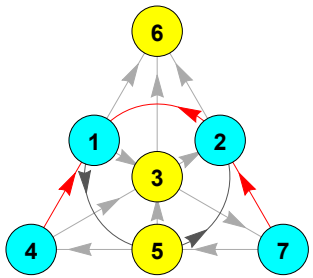
split=4

Fano plane



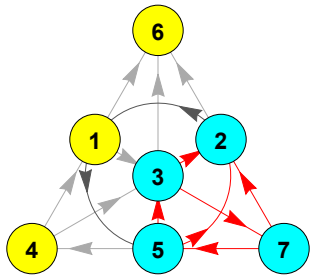
split=6

Fano plane



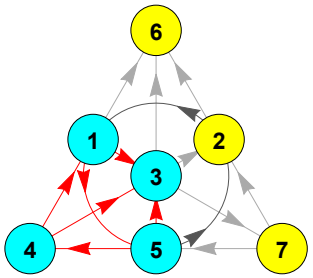
split=3

Fano plane



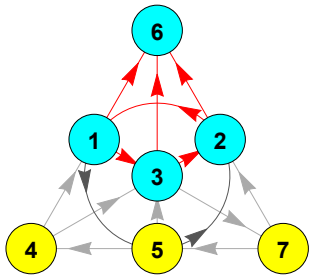
split=5

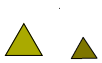
Fano plane



split=7

Fano plane

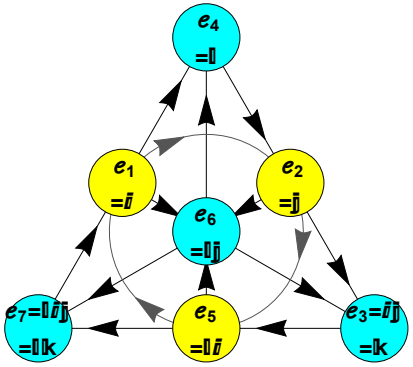


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
183	$\mu_{\bar{y}_d \bar{L}}$		0apggsscc	Bn{	1	1	0	0	0	1	1	1 }	Zn
			000100000_2	E8{	0	0	0	1	1	0	0	0 }	30

flip=False

{1, 2, 5}{1, 6, 3}{1, 4, 7}{2, 3, 4}{2, 6, 7}{3, 5, 7}{4, 5, 6}

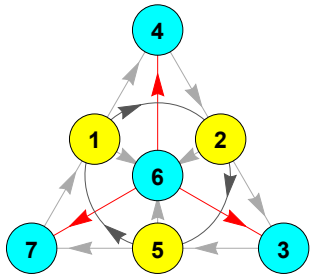
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	$-e_6$	e_7	$-e_2$	e_3	$-e_4$
e_2	$-e_5$	−1	e_4	$-e_3$	e_1	e_7	$-e_6$
e_3	e_6	$-e_4$	−1	e_2	e_7	$-e_1$	$-e_5$
e_4	$-e_7$	e_3	$-e_2$	−1	e_6	$-e_5$	e_1
e_5	e_2	$-e_1$	$-e_7$	$-e_6$	−1	e_4	e_3
e_6	$-e_3$	$-e_7$	e_1	e_5	$-e_4$	−1	e_2
e_7	e_4	e_6	e_5	$-e_1$	$-e_3$	$-e_2$	−1

split=1

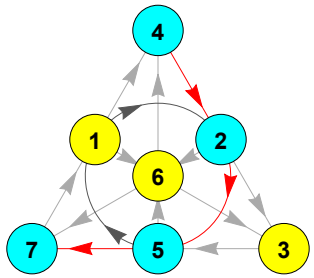
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−6	7	−2	3	−4
2	−5	−1	4	−3	1	7	−6
3	6	−4	1	−2	7	1	5
4	−7	3	2	1	6	5	−1
5	2	−1	−7	−6	−1	4	3
6	−3	−7	−1	−5	−4	1	−2
7	4	6	−5	1	−3	2	1

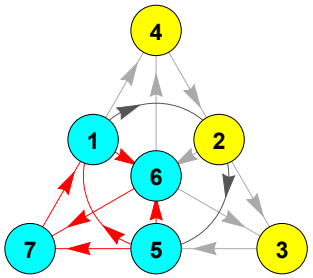
split=2

Fano plane



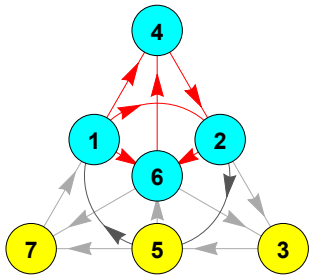
split=4

Fano plane



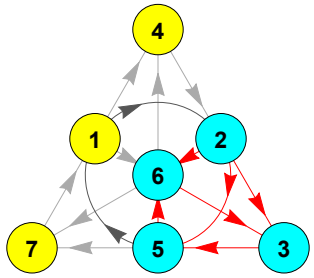
split=6

Fano plane



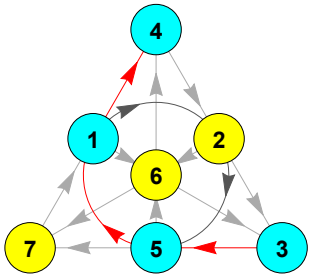
split=3

Fano plane



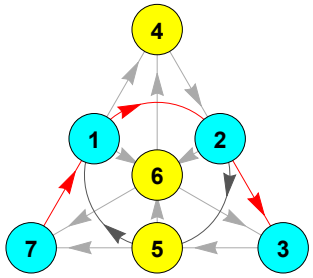
split=5

Fano plane



split=7

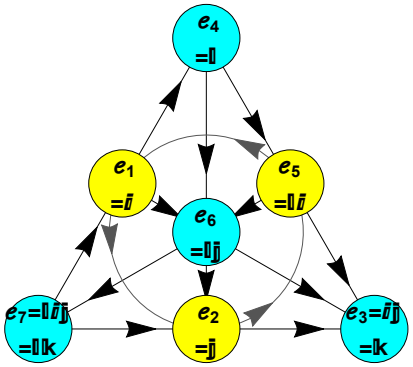
Fano plane



flip=True

{1, 2, 5}{1, 6, 3}{1, 4, 7}{2, 3, 7}{2, 4, 6}{3, 4, 5}{5, 6, 7}

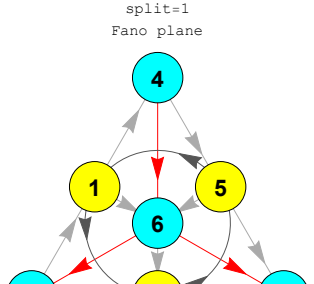
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	$-e_6$	e_7	$-e_2$	e_3	$-e_4$
e_2	$-e_5$	−1	e_7	e_6	e_1	$-e_4$	$-e_3$
e_3	e_6	$-e_7$	−1	e_5	$-e_4$	$-e_1$	e_2
e_4	$-e_7$	$-e_6$	$-e_5$	−1	e_3	e_2	e_1
e_5	e_2	$-e_1$	e_4	$-e_3$	−1	e_7	$-e_6$
e_6	$-e_3$	e_4	e_1	$-e_2$	$-e_7$	−1	e_5
e_7	e_4	e_3	$-e_2$	$-e_1$	e_6	$-e_5$	−1

split=1

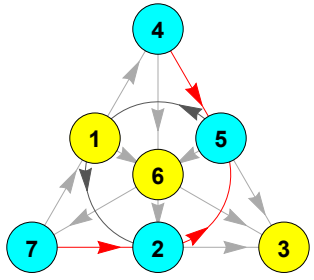
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−6	7	−2	3	−4
2	−5	−1	7	6	1	−4	−3
3	6	−7	1	−5	−4	1	−2
4	−7	−6	5	1	3	−2	−1
5	2	−1	4	−3	−1	7	−6
6	−3	4	−1	2	−7	1	−5
7	4	3	2	1	6	5	1

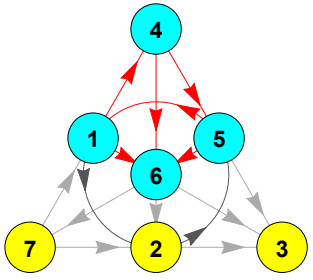
split=2

Fano plane



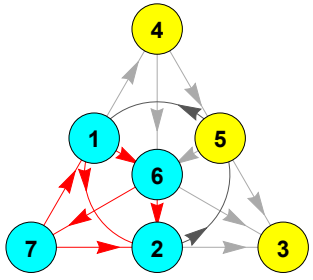
split=4

Fano plane



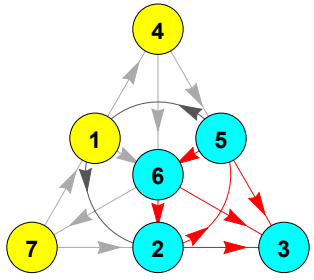
split=6

Fano plane



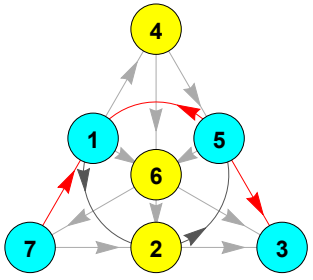
split=3

Fano plane



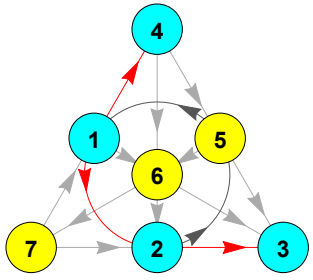
split=5

Fano plane



split=7

Fano plane

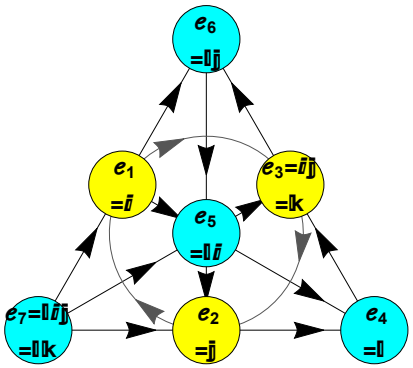


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
184	$\overline{e_{\tau\Phi}}_{r_d}^{0\to1}$		0apggsscc 011000001$_2$	Bn{ E8{	1 0	0 0	1 1	1 −1	1 0	1 0	0 0	0 0	} }	C 6

flip=False

{1, 3, 2}{1, 5, 4}{1, 6, 7}{2, 4, 7}{2, 6, 5}{3, 6, 4}{3, 7, 5}

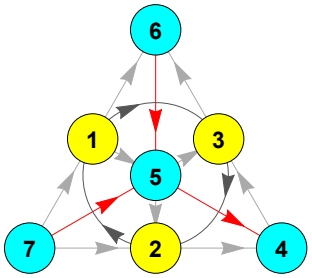
Fano plane



1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	$-e_5$	e_4	e_7	$-e_6$
e_2	e_3	−1	$-e_1$	e_7	$-e_6$	e_5	$-e_4$
e_3	$-e_2$	e_1	−1	$-e_6$	$-e_7$	e_4	e_5
e_4	e_5	$-e_7$	e_6	−1	$-e_1$	$-e_3$	e_2
e_5	$-e_4$	e_6	e_7	e_1	−1	$-e_2$	$-e_3$
e_6	$-e_7$	$-e_5$	$-e_4$	e_3	e_2	−1	e_1
e_7	e_6	e_4	$-e_5$	$-e_2$	e_3	$-e_1$	−1

split=1

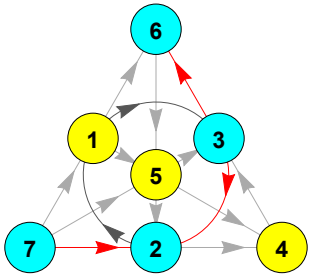
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−5	4	7	−6
2	3	−1	−1	7	−6	5	−4
3	−2	1	−1	−6	−7	4	5
4	5	−7	6	1	1	3	−2
5	−4	6	7	−1	1	2	3
6	−7	−5	−4	−3	−2	1	−1
7	6	4	−5	2	−3	1	1

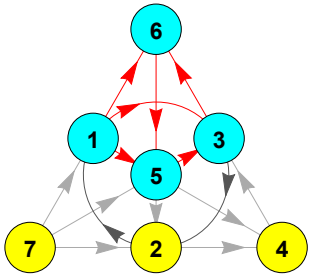
split=2

Fano plane



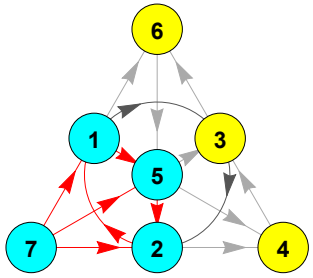
split=4

Fano plane



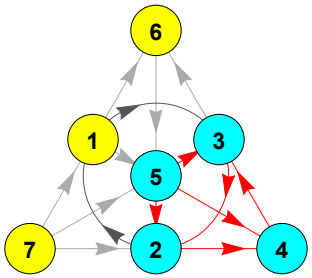
split=6

Fano plane



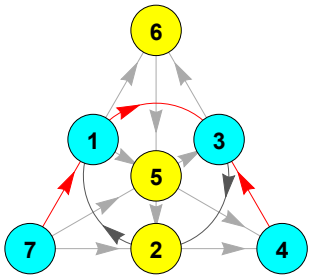
split=3

Fano plane



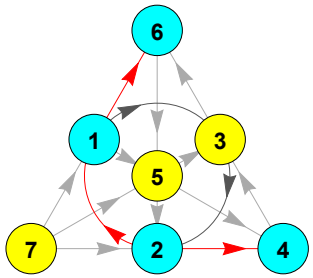
split=5

Fano plane



split=7

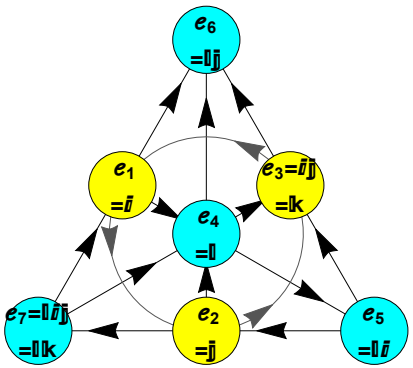
Fano plane



flip=True

{1, 2, 3}{1, 4, 5}{1, 6, 7}{2, 4, 6}{2, 7, 5}{3, 7, 4}{3, 6, 5}

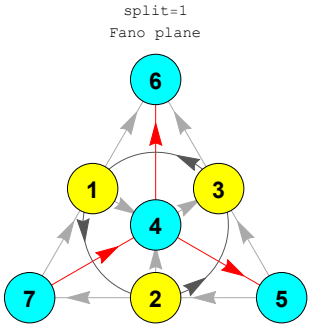
Fano plane



1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	e_5	$-e_4$	e_7	$-e_6$
e_2	$-e_3$	−1	e_1	e_6	$-e_7$	$-e_4$	e_5
e_3	e_2	$-e_1$	−1	$-e_7$	$-e_6$	e_5	e_4
e_4	$-e_5$	$-e_6$	e_7	−1	e_1	e_2	$-e_3$
e_5	e_4	e_7	e_6	$-e_1$	−1	$-e_3$	$-e_2$
e_6	$-e_7$	e_4	$-e_5$	$-e_2$	e_3	−1	e_1
e_7	e_6	$-e_5$	$-e_4$	e_3	e_2	$-e_1$	−1

split=1

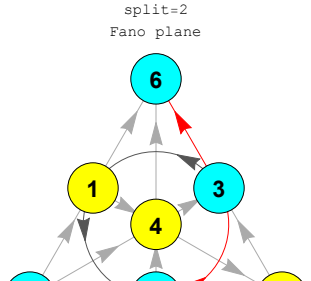
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	5	−4	7	−6
2	−3	−1	1	6	−7	−4	5
3	2	−1	−1	−7	−6	5	4
4	−5	−6	7	1	−1	−2	3
5	4	7	6	1	1	3	2
6	−7	4	−5	2	−3	1	−1
7	6	−5	−4	−3	−2	1	1

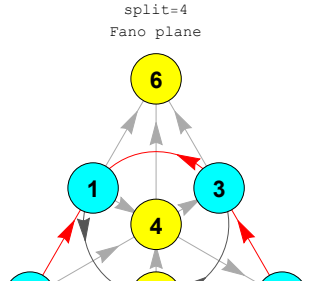
split=2

Fano plane



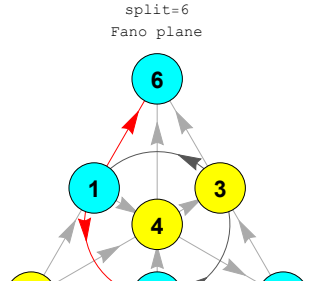
split=4

Fano plane



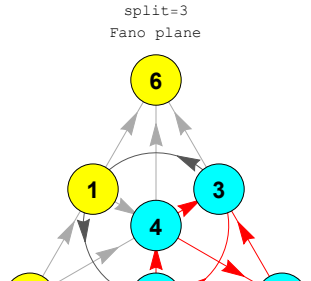
split=6

Fano plane



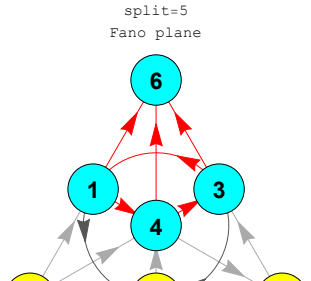
split=3

Fano plane



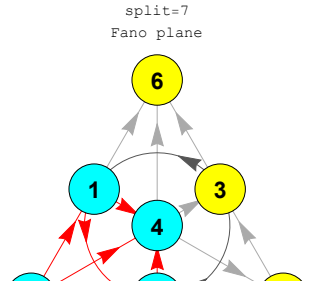
split=5

Fano plane



split=7

Fano plane

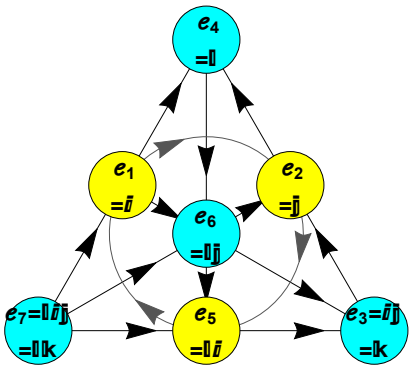


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
185	$\overline{\nu_\mu}^{\,0}_{w_d}$		0apggsscc 011100000_2	Bn{ E8{	1 0	0 0	1 1	1 0	1 −1	0 0	1 0	0 0	} }	Al 13

flip=False

{1, 2, 5}{1, 6, 3}{1, 4, 7}{2, 4, 3}{2, 7, 6}{3, 7, 5}{4, 6, 5}

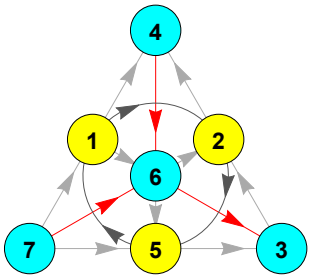
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	$-e_6$	e_7	$-e_2$	e_3	$-e_4$
e_2	e_2	$-e_5$	−1	$-e_4$	e_3	e_1	$-e_7$	e_6
e_3	e_3	e_6	e_4	−1	$-e_2$	$-e_7$	e_1	e_5
e_4	e_4	$-e_7$	$-e_3$	e_2	−1	$-e_6$	e_5	e_1
e_5	e_5	e_2	$-e_1$	e_7	e_6	−1	$-e_4$	$-e_3$
e_6	e_6	$-e_3$	e_7	e_1	$-e_5$	e_4	−1	$-e_2$
e_7	e_7	e_4	$-e_6$	$-e_5$	$-e_1$	e_3	e_2	−1

split=1

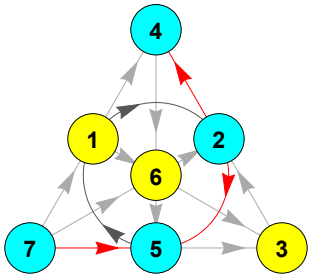
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−6	7	−2	3	−4
2	−5	−1	−4	3	1	−7	6
3	6	4	1	2	−7	1	−5
4	−7	−3	−2	1	−6	−5	−1
5	2	−1	7	6	−1	−4	−3
6	−3	7	−1	5	4	1	2
7	4	−6	5	1	3	−2	1

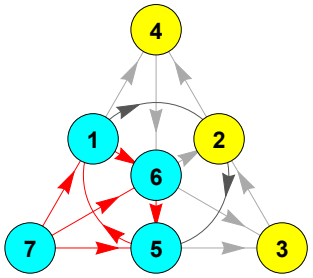
split=2

Fano plane



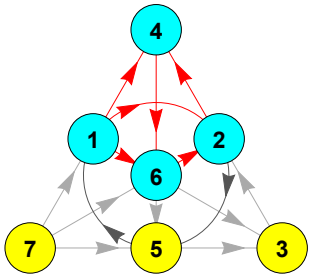
split=4

Fano plane



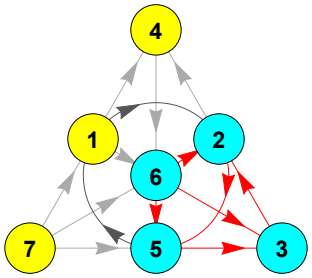
split=6

Fano plane



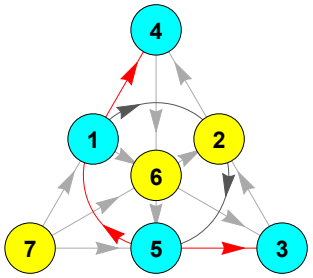
split=3

Fano plane



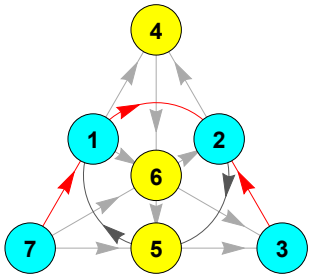
split=5

Fano plane



split=7

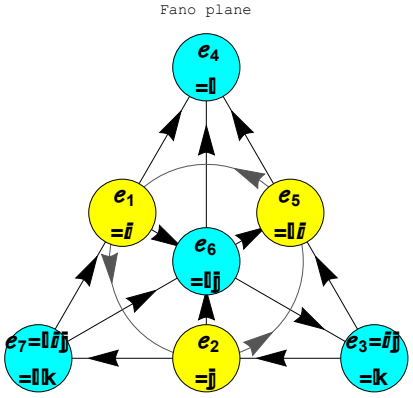
Fano plane



flip=True

{1, 2, 5}{1, 6, 3}{1, 4, 7}{2, 7, 3}{2, 6, 4}{3, 5, 4}{5, 7, 6}

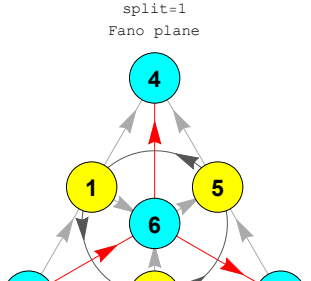
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	$-e_6$	e_7	$-e_2$	e_3	$-e_4$
e_2	e_2	$-e_5$	−1	$-e_7$	$-e_6$	e_1	e_4	e_3
e_3	e_3	e_6	e_7	−1	$-e_5$	e_4	$-e_1$	$-e_2$
e_4	e_4	$-e_7$	e_6	e_5	−1	$-e_3$	$-e_2$	e_1
e_5	e_5	e_2	$-e_1$	$-e_4$	e_3	−1	$-e_7$	e_6
e_6	e_6	$-e_3$	$-e_4$	e_1	e_2	e_7	−1	$-e_5$
e_7	e_7	e_4	$-e_3$	e_2	$-e_1$	$-e_6$	e_5	−1

split=1

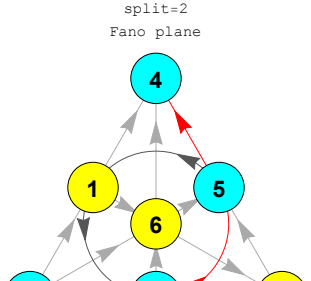
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−6	7	−2	3	−4
2	−5	−1	−7	−6	1	4	3
3	6	7	1	5	4	1	2
4	−7	6	−5	1	−3	2	−1
5	2	−1	−4	3	−1	−7	6
6	−3	−4	−1	−2	7	1	5
7	4	−3	−2	1	−6	−5	1

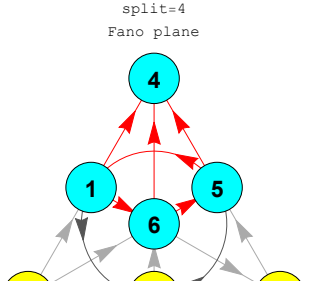
split=2

Fano plane



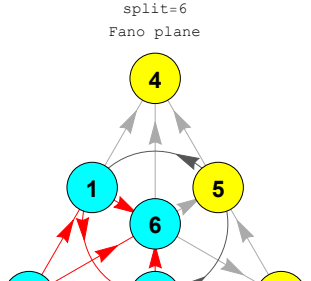
split=4

Fano plane



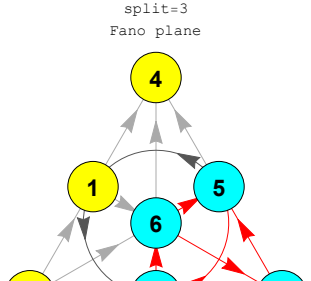
split=6

Fano plane



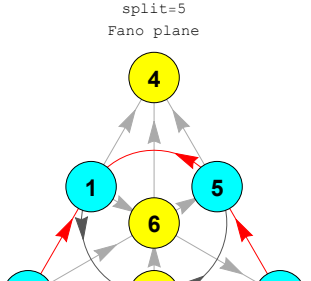
split=3

Fano plane



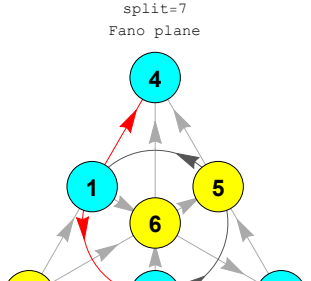
split=5

Fano plane



split=7

Fano plane

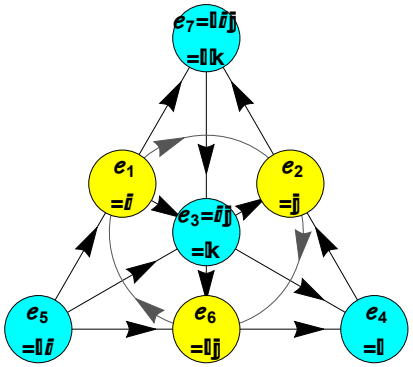


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
186	$s_{o_1}^{\vec{R}\to -1/3}$		0apggsscc 000100101_2	Bn{ E8{	1 0	0 0	1 1	1 0	1 0	0 −1	1 0	} }	Ca 20

flip=False

{1, 2, 6}{1, 3, 4}{1, 7, 5}{2, 5, 3}{2, 7, 4}{3, 6, 7}{4, 5, 6}

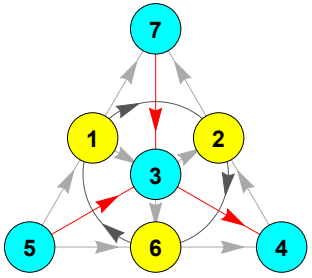
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	e_4	$-e_3$	$-e_7$	$-e_2$	e_5
e_2	$-e_6$	−1	$-e_5$	$-e_7$	e_3	e_1	e_4
e_3	$-e_4$	e_5	−1	e_1	$-e_2$	e_7	$-e_6$
e_4	e_3	e_7	$-e_1$	−1	e_6	$-e_5$	$-e_2$
e_5	e_7	$-e_3$	e_2	$-e_6$	−1	e_4	$-e_1$
e_6	e_2	$-e_1$	$-e_7$	e_5	$-e_4$	−1	e_3
e_7	$-e_5$	$-e_4$	e_6	e_2	e_1	$-e_3$	−1

split=1

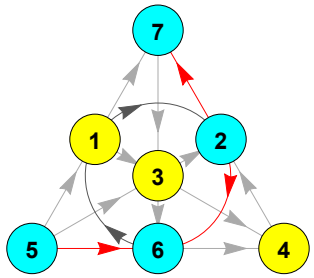
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	4	−3	−7	−2	5
2	−6	−1	−5	−7	3	1	4
3	−4	5	1	−1	2	7	6
4	3	7	1	1	−6	−5	2
5	7	−3	−2	6	1	4	1
6	2	−1	−7	5	−4	−1	3
7	−5	−4	−6	−2	−1	−3	1

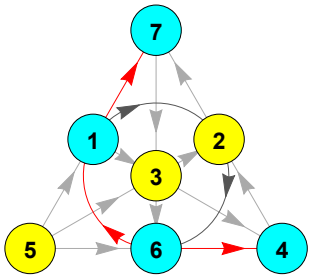
split=2

Fano plane



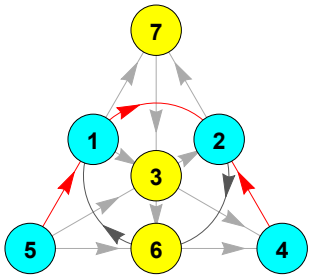
split=4

Fano plane



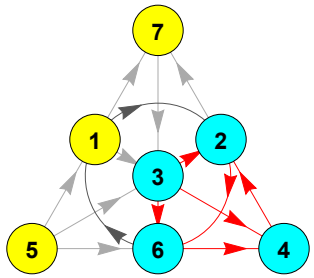
split=6

Fano plane



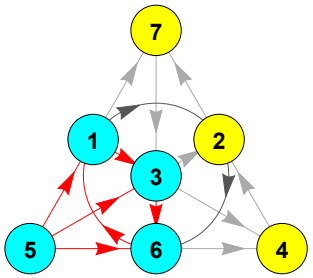
split=3

Fano plane



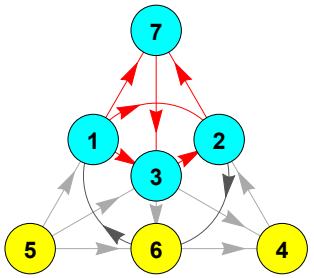
split=5

Fano plane



split=7

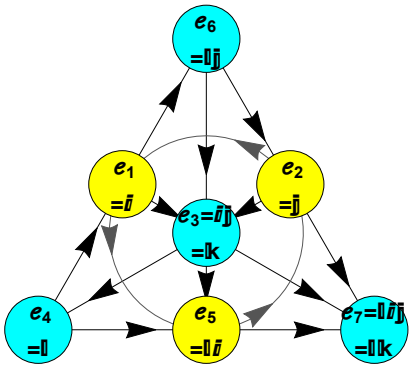
Fano plane



flip=True

{1, 5, 2}{1, 3, 7}{1, 6, 4}{2, 3, 4}{2, 7, 6}{3, 5, 6}{4, 5, 7}

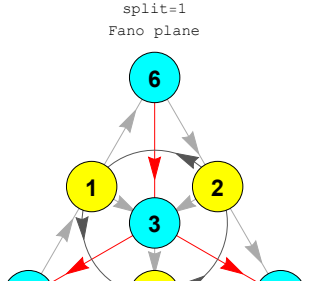
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_7	$-e_6$	e_2	e_4	$-e_3$
e_2	e_5	−1	e_4	$-e_3$	$-e_1$	$-e_7$	e_6
e_3	$-e_7$	$-e_4$	−1	e_2	e_6	$-e_5$	e_1
e_4	e_6	e_3	$-e_2$	−1	e_7	$-e_1$	$-e_5$
e_5	$-e_2$	e_1	$-e_6$	$-e_7$	−1	e_3	e_4
e_6	$-e_4$	e_7	e_5	e_1	$-e_3$	−1	$-e_2$
e_7	e_3	$-e_6$	$-e_1$	e_5	$-e_4$	e_2	−1

split=1

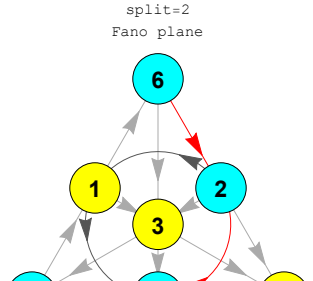
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	7	−6	2	4	−3
2	5	−1	4	−3	−1	−7	6
3	−7	−4	1	−2	6	5	−1
4	6	3	2	1	7	1	5
5	−2	1	−6	−7	−1	3	4
6	−4	7	−5	−1	−3	1	2
7	3	−6	1	−5	−4	−2	1

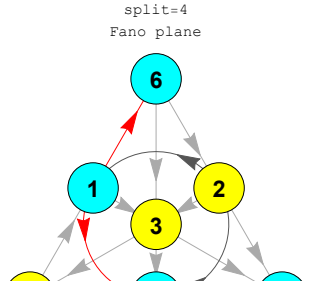
split=2

Fano plane



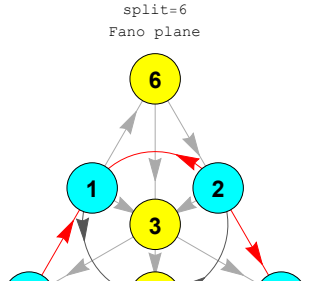
split=4

Fano plane



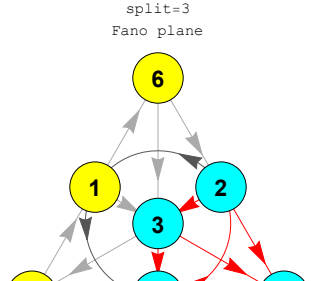
split=6

Fano plane



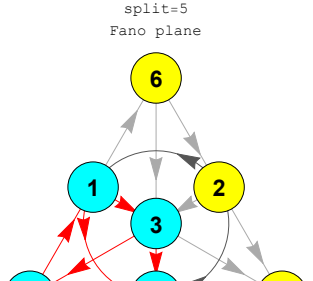
split=3

Fano plane



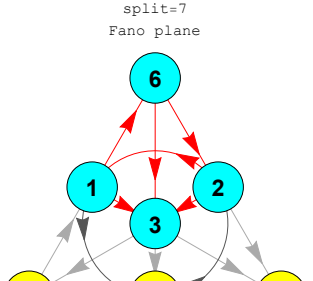
split=5

Fano plane



split=7

Fano plane

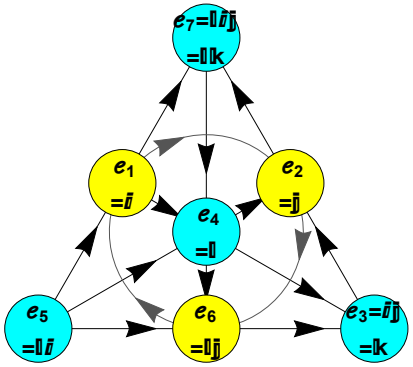


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
187	$s_{c_1}^{\vec{R}\to -1/3}$		0apggsscc	Bn{	1	0	1	1	0	1	1	0	}	Fe
			000100110_2	E8{	0	0	1	0	0	0	-1	0	}	26

flip=False

{1, 2, 6}{1, 4, 3}{1, 7, 5}{2, 7, 3}{2, 5, 4}{3, 5, 6}{4, 6, 7}

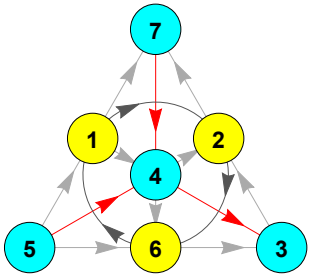
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_4$	e_3	$-e_7$	$-e_2$	e_5
e_2	$-e_6$	-1	$-e_7$	$-e_5$	e_4	e_1	e_3
e_3	e_4	e_7	-1	$-e_1$	e_6	$-e_5$	$-e_2$
e_4	$-e_3$	e_5	e_1	-1	$-e_2$	e_7	$-e_6$
e_5	e_7	$-e_4$	$-e_6$	e_2	-1	e_3	$-e_1$
e_6	e_2	$-e_1$	e_5	$-e_7$	$-e_3$	-1	e_4
e_7	$-e_5$	$-e_3$	e_2	e_6	e_1	$-e_4$	-1

split=1

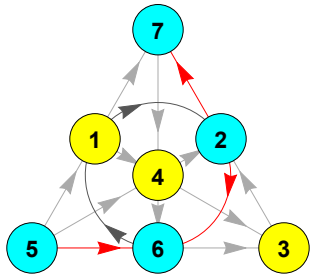
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	-4	3	-7	-2	5
2	-6	-1	-7	-5	4	1	3
3	4	7	1	1	-6	-5	2
4	-3	5	-1	1	2	7	6
5	7	-4	6	-2	1	3	1
6	2	-1	5	-7	-3	-1	4
7	-5	-3	-2	-6	-1	-4	1

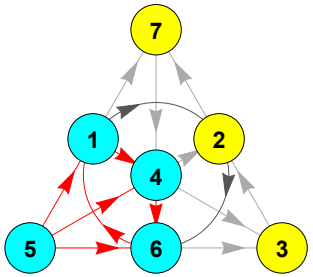
split=2

Fano plane



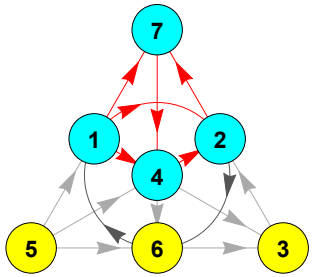
split=4

Fano plane



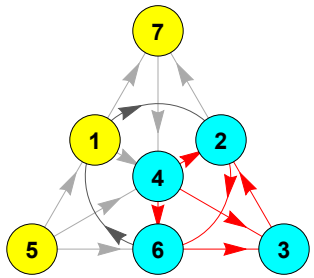
split=6

Fano plane



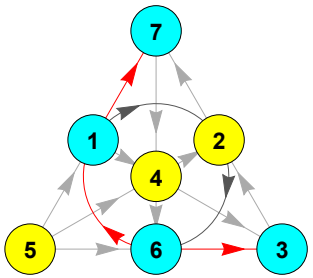
split=3

Fano plane



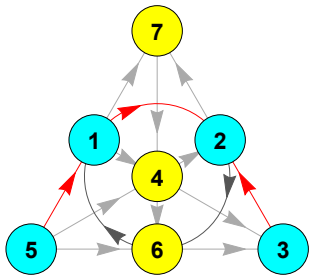
split=5

Fano plane



split=7

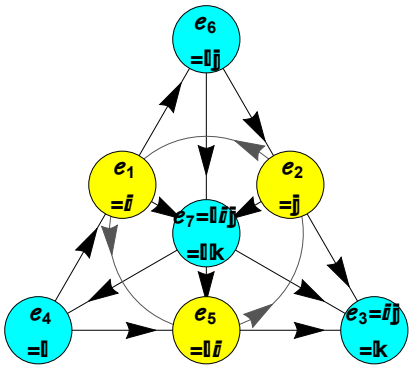
Fano plane



flip=True

{1, 5, 2}{1, 7, 3}{1, 6, 4}{2, 3, 6}{2, 7, 4}{3, 4, 5}{5, 6, 7}

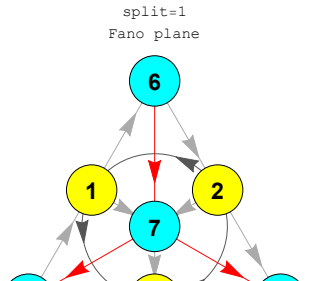
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_5$	$-e_7$	$-e_6$	e_2	e_4	e_3
e_2	e_5	-1	e_6	$-e_7$	$-e_1$	$-e_3$	e_4
e_3	e_7	$-e_6$	-1	e_5	$-e_4$	e_2	$-e_1$
e_4	e_6	e_7	$-e_5$	-1	e_3	$-e_1$	$-e_2$
e_5	$-e_2$	e_1	e_4	$-e_3$	-1	e_7	$-e_6$
e_6	$-e_4$	e_3	$-e_2$	e_1	$-e_7$	-1	e_5
e_7	$-e_3$	$-e_4$	e_1	e_2	e_6	$-e_5$	-1

split=1

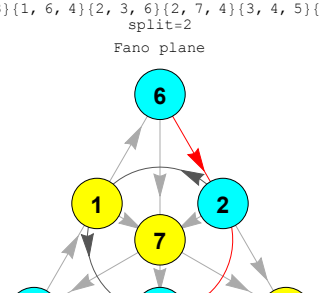
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-5	-7	-6	2	4	3
2	5	-1	6	-7	-1	-3	4
3	7	-6	1	-5	-4	-2	1
4	6	7	5	1	3	1	2
5	-2	1	4	-3	-1	7	-6
6	-4	3	2	-1	-7	1	-5
7	-3	-4	-1	-2	6	5	1

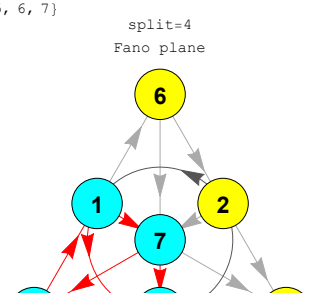
split=2

Fano plane



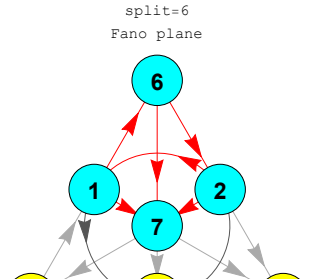
split=4

Fano plane



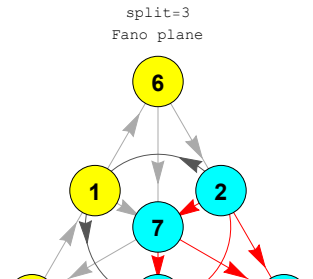
split=6

Fano plane



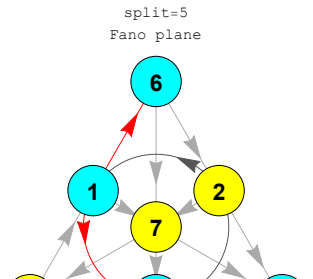
split=3

Fano plane



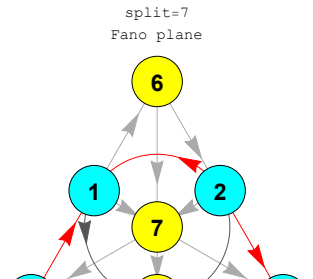
split=5

Fano plane



split=7

Fano plane

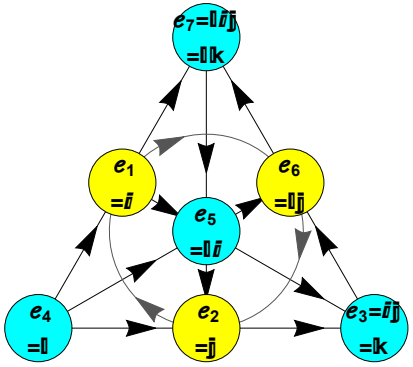


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits				Binary / E8 Coordinates								Ele #
188	$s_{m_1}^{-1/3}$		0apggsscc	Bn{	1	0	1	1	0	1	0	1	}	Uuo
			000100111_2	E8{	0	0	1	0	0	0	0	−1	}	118

flip=False

{1, 6, 2}{1, 5, 3}{1, 7, 4}{2, 3, 4}{2, 7, 5}{3, 6, 7}{4, 5, 6}

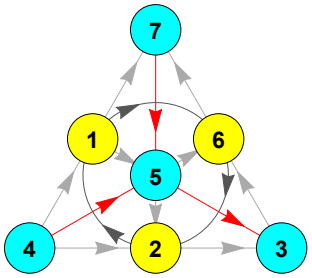
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_5$	$-e_7$	e_3	e_2	e_4
e_2	e_6	−1	e_4	$-e_3$	$-e_7$	$-e_1$	e_5
e_3	e_5	$-e_4$	−1	e_2	$-e_1$	e_7	$-e_6$
e_4	e_7	e_3	$-e_2$	−1	e_6	$-e_5$	$-e_1$
e_5	$-e_3$	e_7	e_1	$-e_6$	−1	e_4	$-e_2$
e_6	$-e_2$	e_1	$-e_7$	e_5	$-e_4$	−1	e_3
e_7	$-e_4$	$-e_5$	e_6	e_1	e_2	$-e_3$	−1

split=1

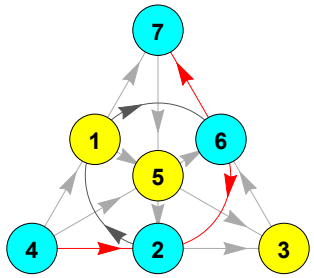
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−5	−7	3	2	4
2	6	−1	4	−3	−7	−1	5
3	5	−4	1	−2	1	7	6
4	7	3	2	1	−6	−5	1
5	−3	7	−1	6	1	4	2
6	−2	1	−7	5	−4	−1	3
7	−4	−5	−6	−1	−2	−3	1

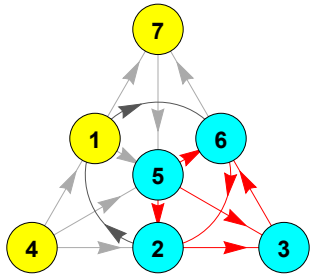
split=2

Fano plane



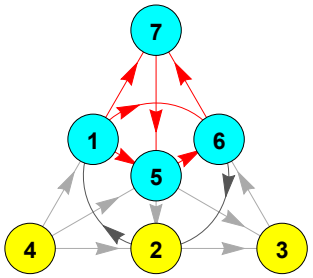
split=3

Fano plane



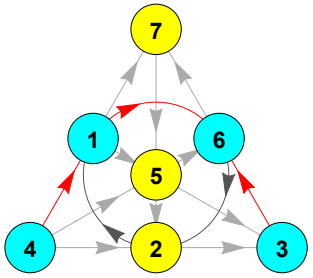
split=4

Fano plane



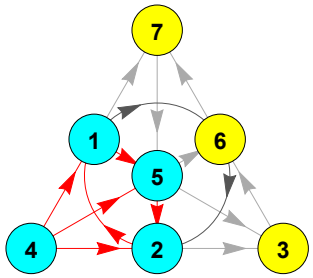
split=5

Fano plane



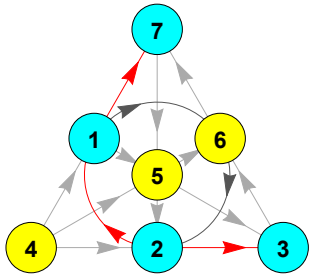
split=6

Fano plane



split=7

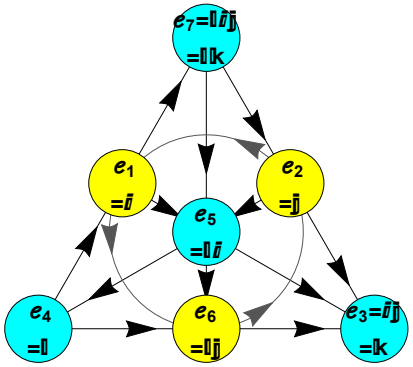
Fano plane



flip=True

{1, 6, 2}{1, 5, 3}{1, 7, 4}{2, 3, 7}{2, 5, 4}{3, 4, 6}{5, 6, 7}

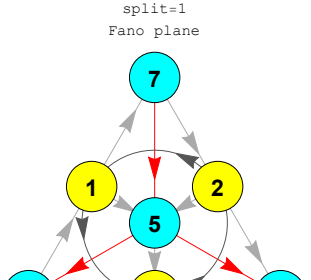
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_5$	$-e_7$	e_3	e_2	e_4
e_2	e_6	−1	e_7	$-e_5$	e_4	$-e_1$	$-e_3$
e_3	e_5	$-e_7$	−1	e_6	$-e_1$	$-e_4$	e_2
e_4	e_7	e_5	$-e_6$	−1	$-e_2$	e_3	$-e_1$
e_5	$-e_3$	$-e_4$	e_1	e_2	−1	e_7	$-e_6$
e_6	$-e_2$	e_1	e_4	$-e_3$	$-e_7$	−1	e_5
e_7	$-e_4$	e_3	$-e_2$	e_1	e_6	$-e_5$	−1

split=1

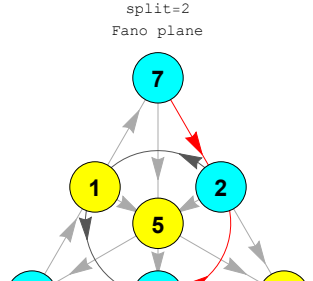
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−5	−7	3	2	4
2	6	−1	7	−5	4	−1	−3
3	5	−7	1	−6	1	−4	−2
4	7	5	6	1	2	3	1
5	−3	−4	−1	−2	1	7	6
6	−2	1	4	−3	−7	−1	5
7	−4	3	2	−1	−6	−5	1

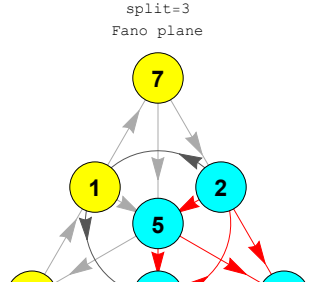
split=2

Fano plane



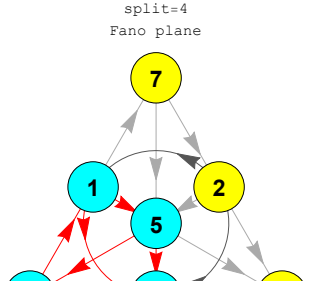
split=3

Fano plane



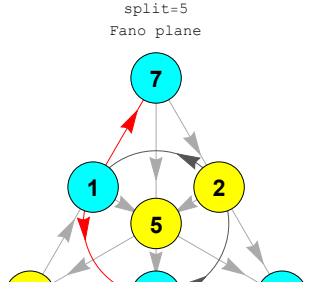
split=4

Fano plane



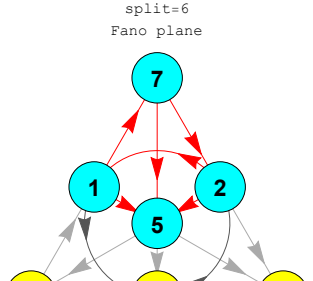
split=5

Fano plane



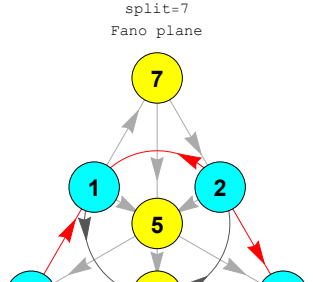
split=6

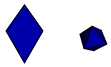
Fano plane



split=7

Fano plane

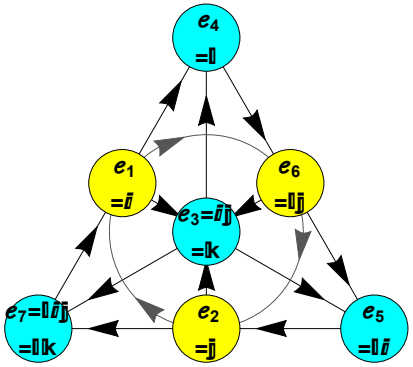


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits				Binary / E8 Coordinates								Ele #
189	$\overline{\underset{b_d}{c}}^{-2/3\to 1/3}$		0apggsscc	Bn{	1	0	1	1	0	0	1	1	}	$\overline{Rf}$
			01110011_2	E8{	0	0	1	0	0	0	0	1	}	104

flip=False

{1, 6, 2}{1, 3, 5}{1, 4, 7}{2, 3, 4}{2, 7, 5}{3, 7, 6}{4, 6, 5}

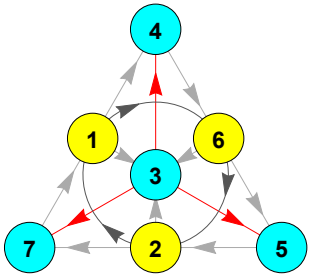
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_5	e_7	$-e_3$	e_2	$-e_4$
e_2	e_6	−1	e_4	$-e_3$	$-e_7$	$-e_1$	e_5	
e_3	$-e_5$	$-e_4$	−1	e_2	e_1	$-e_7$	e_6	
e_4	$-e_7$	e_3	$-e_2$	−1	$-e_6$	e_5	e_1	
e_5	e_3	e_7	$-e_1$	e_6	−1	$-e_4$	$-e_2$	
e_6	$-e_2$	e_1	e_7	$-e_5$	e_4	−1	$-e_3$	
e_7	e_4	$-e_5$	$-e_6$	$-e_1$	e_2	e_3	−1	

split=1

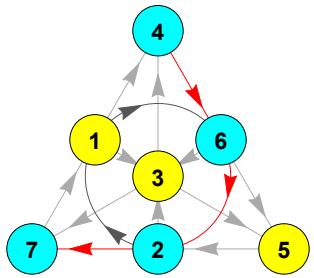
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	5	7	−3	2	−4
2	6	−1	4	−3	−7	−1	5
3	−5	−4	1	−2	−1	−7	−6
4	−7	3	2	1	6	5	−1
5	3	7	1	−6	1	−4	2
6	−2	1	7	−5	4	−1	−3
7	4	−5	6	1	−2	3	1

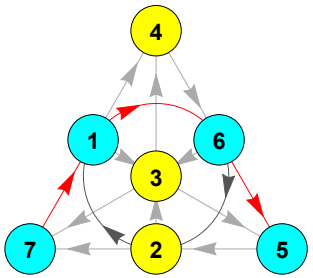
split=2

Fano plane



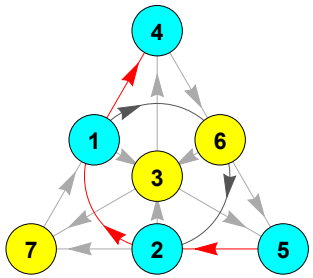
split=4

Fano plane



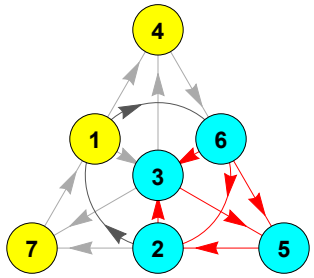
split=6

Fano plane



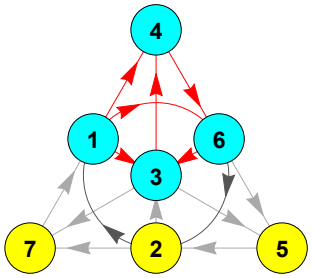
split=3

Fano plane



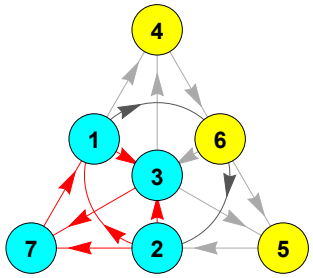
split=5

Fano plane



split=7

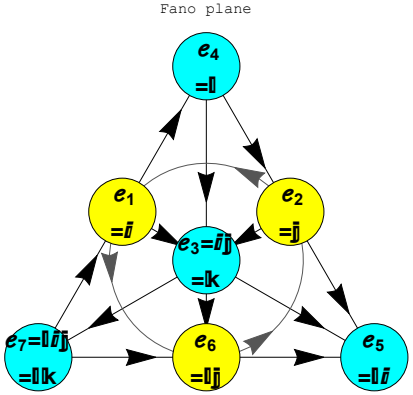
Fano plane



flip=True

{1, 6, 2}{1, 3, 5}{1, 4, 7}{2, 3, 7}{2, 5, 4}{3, 6, 4}{5, 7, 6}

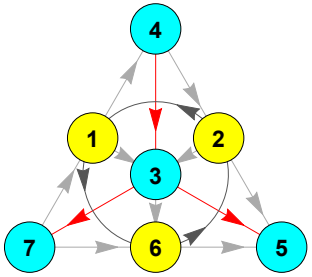
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_5	e_7	$-e_3$	e_2	$-e_4$
e_2	e_6	−1	e_7	$-e_5$	e_4	$-e_1$	$-e_3$	
e_3	$-e_5$	$-e_7$	−1	$-e_6$	e_1	e_4	e_2	
e_4	$-e_7$	e_5	e_6	−1	$-e_2$	$-e_3$	e_1	
e_5	e_3	$-e_4$	$-e_1$	e_2	−1	$-e_7$	e_6	
e_6	$-e_2$	e_1	$-e_4$	e_3	e_7	−1	$-e_5$	
e_7	e_4	e_3	$-e_2$	$-e_1$	$-e_6$	e_5	−1	

split=1

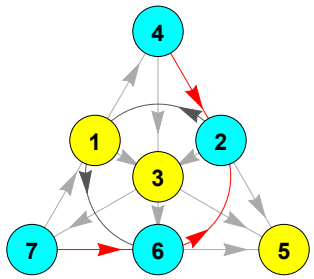
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	5	7	−3	2	−4
2	6	−1	7	−5	4	−1	−3
3	−5	−7	1	6	−1	4	−2
4	−7	5	−6	1	2	−3	−1
5	3	−4	1	−2	1	−7	−6
6	−2	1	−4	3	7	−1	−5
7	4	3	2	1	6	5	1

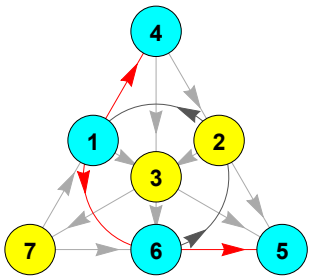
split=2

Fano plane



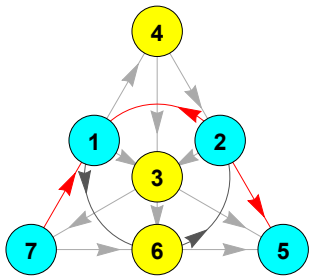
split=4

Fano plane



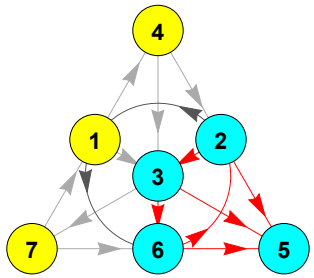
split=6

Fano plane



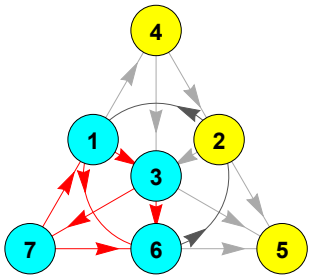
split=3

Fano plane



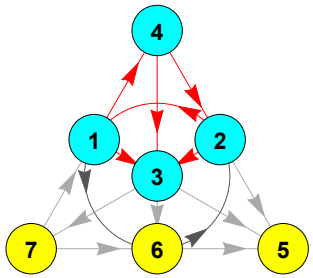
split=5

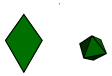
Fano plane



split=7

Fano plane

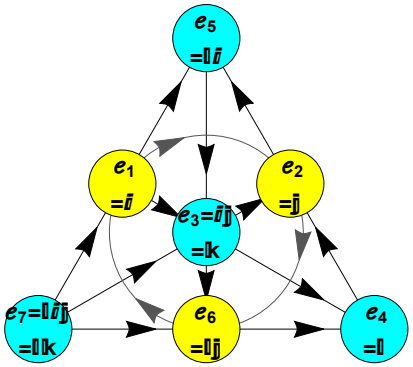


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
190	$\overline{\overline{C}}_{g_d}^{0\to 1/3}$		0apggsscc 011100010_2	Bn{ E8{	1 0	0 0	1 1	0 0	1 0	1 0	1 1	0 0	} }	Co 27

flip=False

{1, 2, 6}{1, 3, 4}{1, 5, 7}{2, 7, 3}{2, 5, 4}{3, 6, 5}{4, 7, 6}

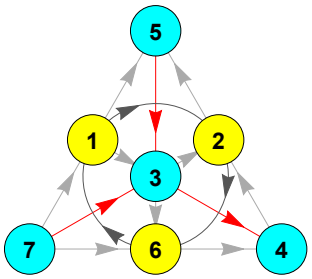
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	e_4	$-e_3$	e_7	$-e_2$	$-e_5$
e_2	$-e_6$	−1	$-e_7$	$-e_5$	e_4	e_1	e_3
e_3	$-e_4$	e_7	−1	e_1	$-e_6$	e_5	$-e_2$
e_4	e_3	e_5	$-e_1$	−1	$-e_2$	$-e_7$	e_6
e_5	$-e_7$	$-e_4$	e_6	e_2	−1	$-e_3$	e_1
e_6	e_2	$-e_1$	$-e_5$	e_7	e_3	−1	$-e_4$
e_7	e_5	$-e_3$	e_2	$-e_6$	$-e_1$	e_4	−1

split=1

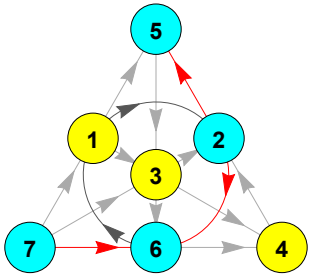
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	4	−3	7	−2	−5
2	−6	−1	−7	−5	4	1	3
3	−4	7	1	−1	6	5	2
4	3	5	1	1	2	−7	−6
5	−7	−4	−6	−2	1	−3	−1
6	2	−1	−5	7	3	−1	−4
7	5	−3	−2	6	1	4	1

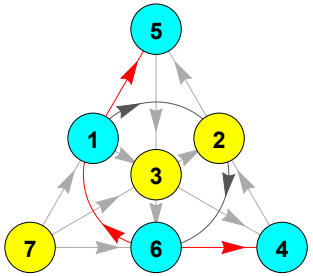
split=2

Fano plane



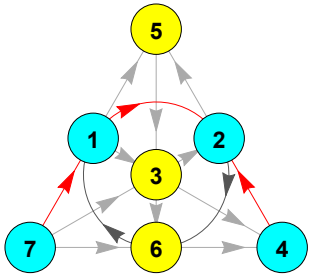
split=4

Fano plane



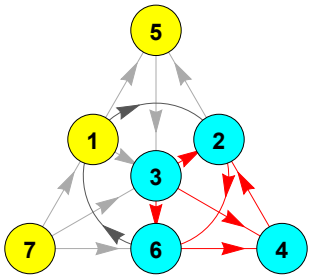
split=6

Fano plane



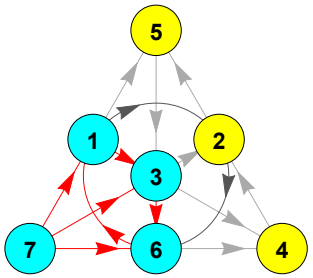
split=3

Fano plane



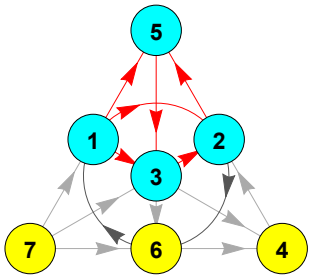
split=5

Fano plane



split=7

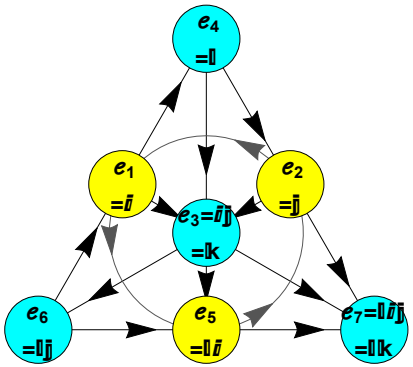
Fano plane



flip=True

{1, 5, 2}{1, 3, 7}{1, 4, 6}{2, 3, 6}{2, 7, 4}{3, 5, 4}{5, 7, 6}

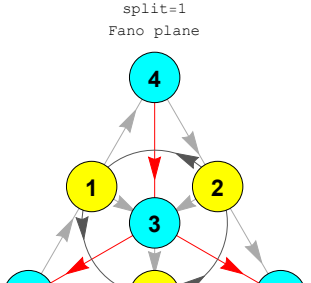
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	e_7	e_6	e_2	$-e_4$	$-e_3$
e_2	e_5	−1	e_6	$-e_7$	$-e_1$	$-e_3$	e_4
e_3	$-e_7$	$-e_6$	−1	$-e_5$	e_4	e_2	e_1
e_4	$-e_6$	e_7	e_5	−1	$-e_3$	e_1	$-e_2$
e_5	$-e_2$	e_1	$-e_4$	e_3	−1	$-e_7$	e_6
e_6	e_4	e_3	$-e_2$	$-e_1$	e_7	−1	$-e_5$
e_7	e_3	$-e_4$	$-e_1$	e_2	$-e_6$	e_5	−1

split=1

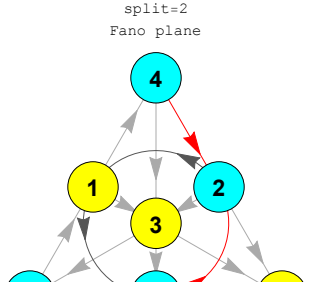
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	7	6	2	−4	−3
2	5	−1	6	−7	−1	−3	4
3	−7	−6	1	5	4	−2	−1
4	−6	7	−5	1	−3	−1	2
5	−2	1	−4	3	−1	−7	6
6	4	3	2	1	7	1	5
7	3	−4	1	−2	−6	−5	1

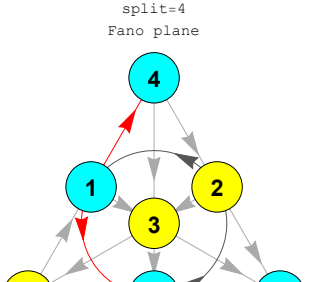
split=2

Fano plane



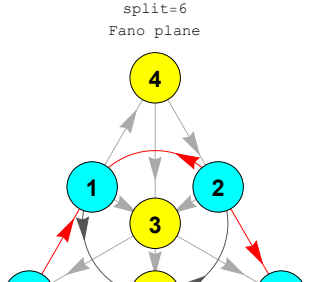
split=4

Fano plane



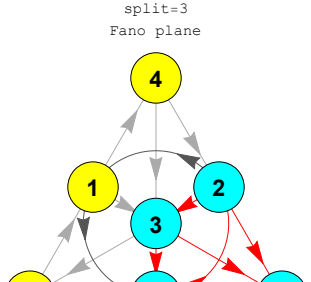
split=6

Fano plane



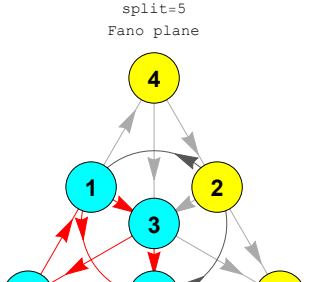
split=3

Fano plane



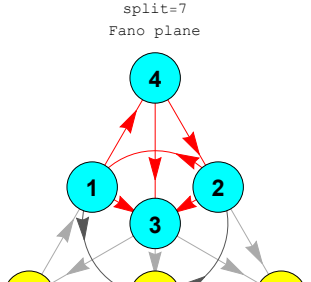
split=5

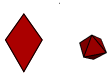
Fano plane



split=7

Fano plane

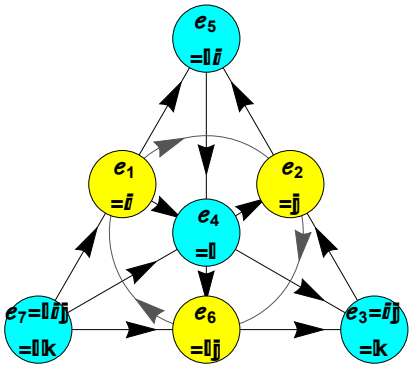


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
191	$\overline{\underset{r_d}{C}}^{0\to 1/3}_{L}$		0apggsscc	Bn{	1	0	1	0	1	1	0	1	}	Ge
			$01110000 1_2$	E8{	0	0	1	0	0	1	0	0	}	32

flip=False

{1, 2, 6}{1, 4, 3}{1, 5, 7}{2, 5, 3}{2, 7, 4}{3, 7, 6}{4, 6, 5}

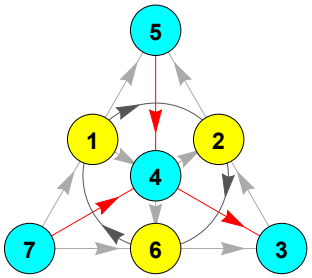
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	$-e_4$	e_3	e_7	$-e_2$	$-e_5$
e_2	e_2	$-e_6$	−1	$-e_5$	$-e_7$	e_3	e_1	e_4
e_3	e_3	e_4	e_5	−1	$-e_1$	$-e_2$	$-e_7$	e_6
e_4	e_4	$-e_3$	e_7	e_1	−1	$-e_6$	e_5	$-e_2$
e_5	e_5	$-e_7$	$-e_3$	e_2	e_6	−1	$-e_4$	e_1
e_6	e_6	e_2	$-e_1$	e_7	$-e_5$	e_4	−1	$-e_3$
e_7	e_7	e_5	$-e_4$	$-e_6$	e_2	$-e_1$	e_3	−1

split=1

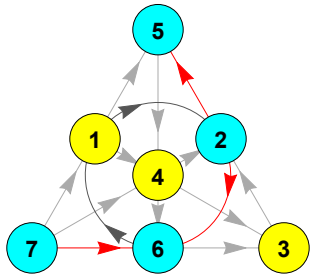
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−4	3	7	−2	−5
2	−6	−1	−5	−7	3	1	4
3	4	5	1	1	2	−7	−6
4	−3	7	−1	1	6	5	2
5	−7	−3	−2	−6	1	−4	−1
6	2	−1	7	−5	4	−1	−3
7	5	−4	6	−2	1	3	1

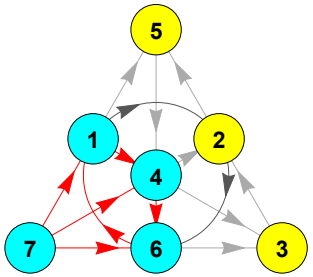
split=2

Fano plane



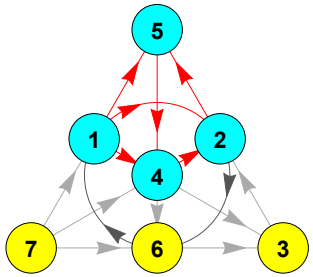
split=4

Fano plane



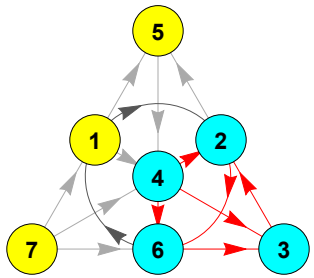
split=6

Fano plane



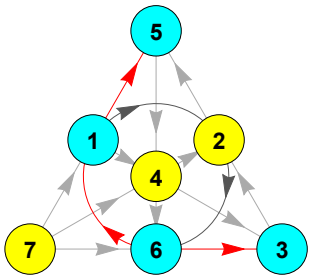
split=3

Fano plane



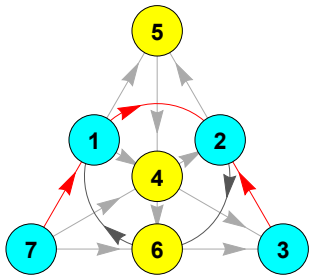
split=5

Fano plane



split=7

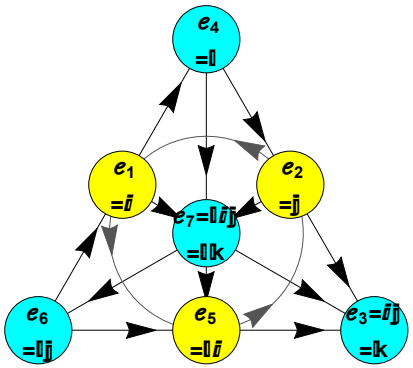
Fano plane



flip=True

{1, 5, 2}{1, 7, 3}{1, 4, 6}{2, 3, 4}{2, 7, 6}{3, 6, 5}{4, 7, 5}

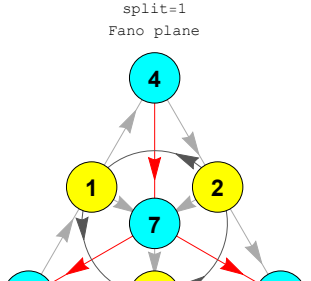
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_5$	$-e_7$	e_6	e_2	$-e_4$	e_3
e_2	e_2	e_5	−1	e_4	$-e_3$	$-e_1$	$-e_7$	e_6
e_3	e_3	e_7	$-e_4$	−1	e_2	$-e_6$	e_5	$-e_1$
e_4	e_4	$-e_6$	e_3	$-e_2$	−1	$-e_7$	e_1	e_5
e_5	e_5	$-e_2$	e_1	e_6	e_7	−1	$-e_3$	$-e_4$
e_6	e_6	e_4	e_7	$-e_5$	$-e_1$	e_3	−1	$-e_2$
e_7	e_7	$-e_3$	$-e_6$	e_1	$-e_5$	e_4	e_2	−1

split=1

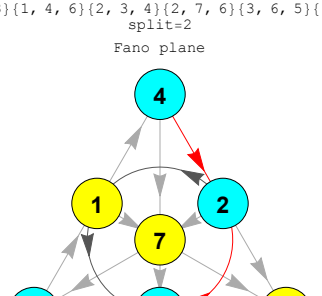
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−7	6	2	−4	3
2	5	−1	4	−3	−1	−7	6
3	7	−4	1	−2	−6	−5	1
4	−6	3	2	1	−7	−1	−5
5	−2	1	6	7	−1	−3	−4
6	4	7	5	1	3	1	2
7	−3	−6	−1	5	4	−2	1

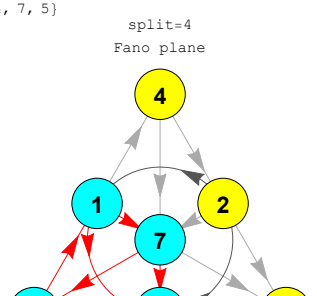
split=2

Fano plane



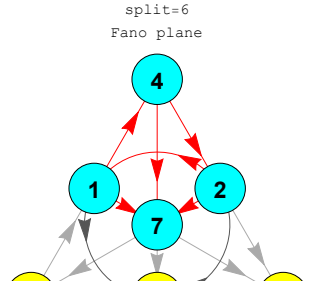
split=4

Fano plane



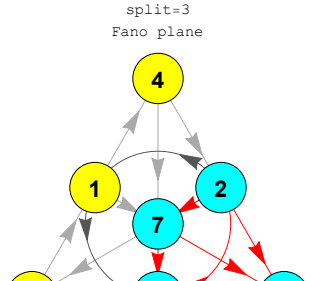
split=6

Fano plane



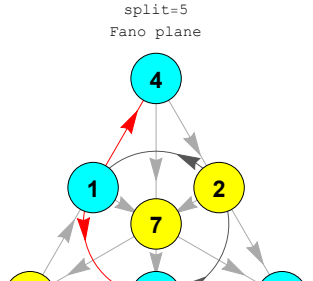
split=3

Fano plane



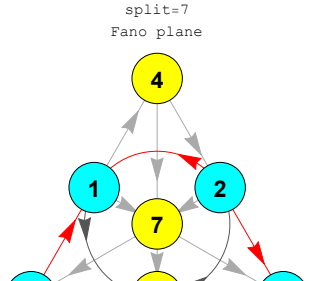
split=5

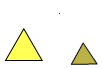
Fano plane



split=7

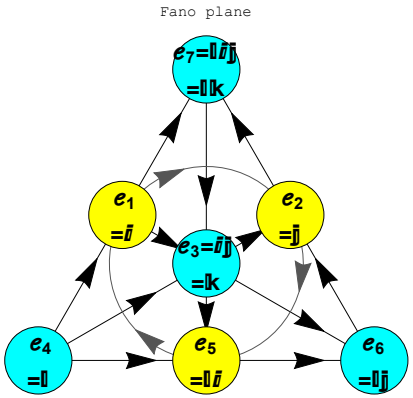
Fano plane



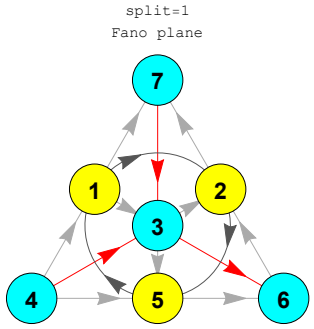
Seq #	Symbol	2D/3D Shape	Particle Quantum Bits									Binary / E8 Coordinates		Ele #
192	$\mu_{\hat{y}_1}^{\hat{R}\to 0}$		0apggsscc									Bn{	}	Sr
			000100100_2									E8{	}	38

flip=False

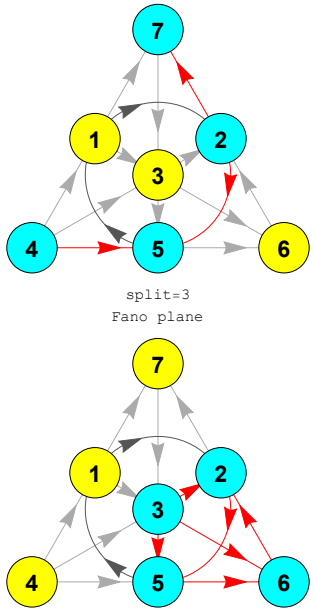
{1, 2, 5}{1, 3, 6}{1, 7, 4}{2, 4, 3}{2, 7, 6}{3, 5, 7}{4, 5, 6}



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_6	$-e_7$	$-e_2$	$-e_3$	e_4
e_2	$-e_5$	−1	$-e_4$	e_3	e_1	$-e_7$	e_6
e_3	$-e_6$	e_4	−1	$-e_2$	e_7	e_1	$-e_5$
e_4	e_7	$-e_3$	e_2	−1	e_6	$-e_5$	$-e_1$
e_5	e_2	$-e_1$	$-e_7$	$-e_6$	−1	e_4	e_3
e_6	e_3	e_7	$-e_1$	e_5	$-e_4$	−1	$-e_2$
e_7	$-e_4$	$-e_6$	e_5	e_1	$-e_3$	e_2	−1

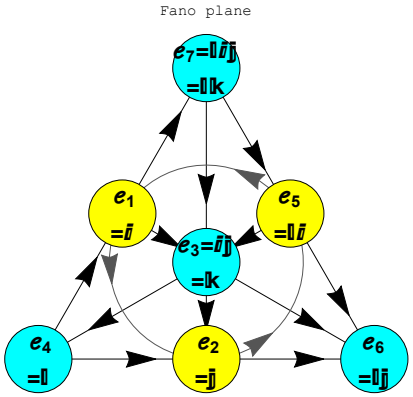


0↦1	1	2	3	4	5	6	7
1	−1	5	6	−7	−2	−3	4
2	−5	−1	−4	3	1	−7	6
3	−6	4	1	2	7	−1	5
4	7	−3	−2	1	6	5	1
5	2	−1	−7	−6	−1	4	3
6	3	7	1	−5	−4	1	2
7	−4	−6	−5	−1	−3	−2	1

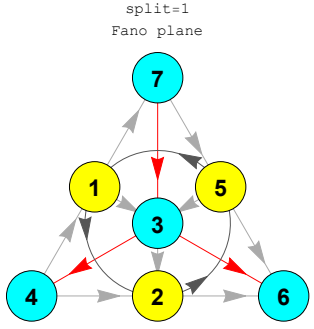


flip=True

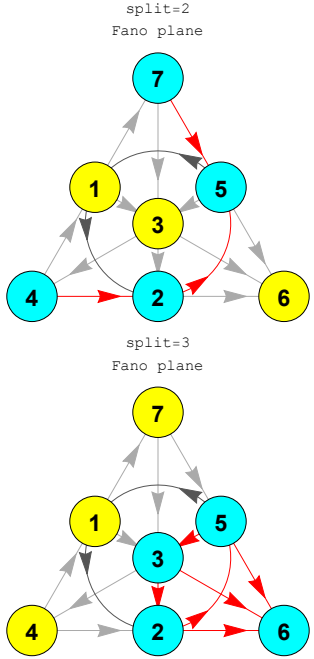
{1, 2, 5}{1, 3, 6}{1, 7, 4}{2, 7, 3}{2, 6, 4}{3, 4, 5}{5, 6, 7}



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_6	$-e_7$	$-e_2$	$-e_3$	e_4
e_2	$-e_5$	−1	$-e_7$	$-e_6$	e_1	e_4	e_3
e_3	$-e_6$	e_7	−1	e_5	$-e_4$	e_1	$-e_2$
e_4	e_7	e_6	$-e_5$	−1	e_3	$-e_2$	$-e_1$
e_5	e_2	$-e_1$	e_4	$-e_3$	−1	e_7	$-e_6$
e_6	e_3	$-e_4$	$-e_1$	e_2	$-e_7$	−1	e_5
e_7	$-e_4$	$-e_3$	e_2	e_1	e_6	$-e_5$	−1



0↦1	1	2	3	4	5	6	7
1	−1	5	6	−7	−2	−3	4
2	−5	−1	−7	−6	1	4	3
3	−6	7	1	−5	−4	−1	2
4	7	6	5	1	3	2	1
5	2	−1	4	−3	−1	7	−6
6	3	−4	1	−2	−7	1	−5
7	−4	−3	−2	−1	6	5	1

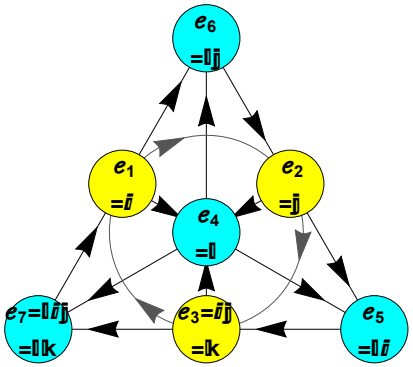


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
193	$\overline{\omega_L}^{0\to-1}_{r_m\ \tilde{R}}$		0apggsscc 011001101_2	Bn{ 1 0 1 0 0 1 1 1 } E8{ 0 0 1 1 0 0 0 0 }								Pd 46

flip=False

{1, 2, 3}{1, 4, 5}{1, 6, 7}{2, 4, 7}{2, 5, 6}{3, 4, 6}{3, 7, 5}

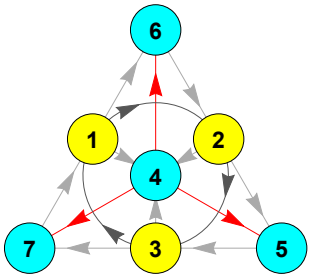
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	e_5	$-e_4$	e_7	$-e_6$
e_2	$-e_3$	−1	e_1	e_7	e_6	$-e_5$	$-e_4$
e_3	e_2	$-e_1$	−1	e_6	$-e_7$	$-e_4$	e_5
e_4	$-e_5$	$-e_7$	$-e_6$	−1	e_1	e_3	e_2
e_5	e_4	$-e_6$	e_7	$-e_1$	−1	e_2	$-e_3$
e_6	$-e_7$	e_5	e_4	$-e_3$	$-e_2$	−1	e_1
e_7	e_6	e_4	$-e_5$	$-e_2$	e_3	$-e_1$	−1

split=1

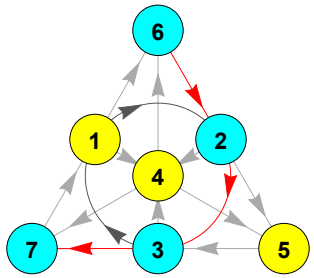
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	5	−4	7	−6
2	−3	−1	1	7	6	−5	−4
3	2	−1	−1	6	−7	−4	5
4	−5	−7	−6	1	−1	−3	−2
5	4	−6	7	1	1	−2	3
6	−7	5	4	3	2	1	−1
7	6	4	−5	2	−3	1	1

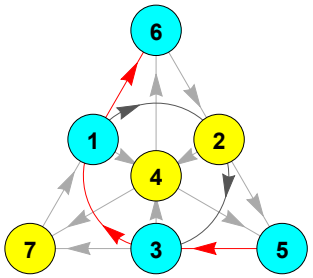
split=2

Fano plane



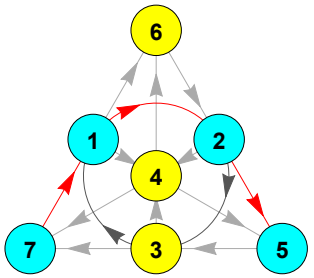
split=4

Fano plane



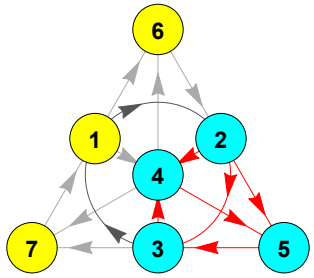
split=6

Fano plane



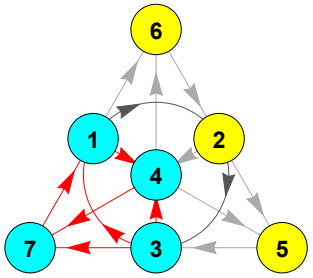
split=3

Fano plane



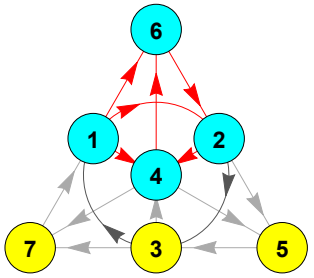
split=5

Fano plane



split=7

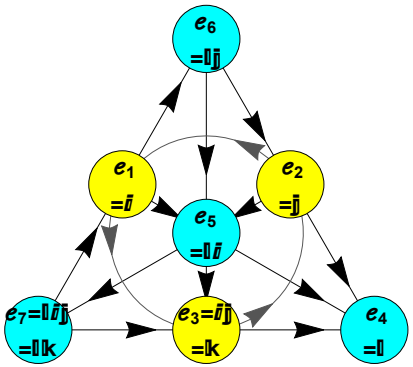
Fano plane



flip=True

{1, 3, 2}{1, 5, 4}{1, 6, 7}{2, 4, 6}{2, 5, 7}{3, 4, 7}{3, 6, 5}

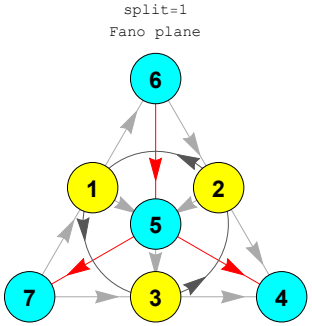
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	$-e_5$	e_4	e_7	$-e_6$
e_2	e_3	−1	$-e_1$	e_6	e_7	$-e_4$	$-e_5$
e_3	$-e_2$	e_1	−1	e_7	$-e_6$	e_5	$-e_4$
e_4	e_5	$-e_6$	$-e_7$	−1	$-e_1$	e_2	e_3
e_5	$-e_4$	$-e_7$	e_6	e_1	−1	$-e_3$	e_2
e_6	$-e_7$	e_4	$-e_5$	$-e_2$	e_3	−1	e_1
e_7	e_6	e_5	e_4	$-e_3$	$-e_2$	$-e_1$	−1

split=1

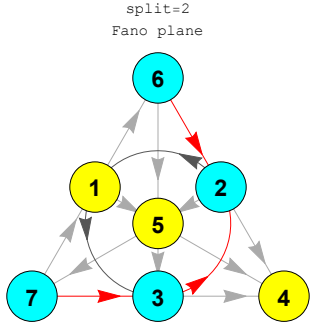
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−5	4	7	−6
2	3	−1	−1	6	7	−4	−5
3	−2	1	−1	7	−6	5	−4
4	5	−6	−7	1	1	−2	−3
5	−4	−7	6	−1	1	3	−2
6	−7	4	−5	2	−3	1	−1
7	6	5	4	3	2	1	1

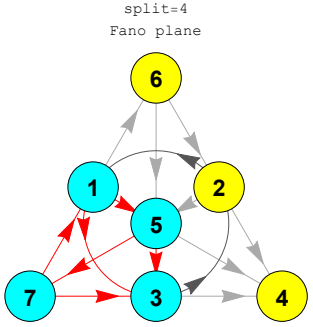
split=2

Fano plane



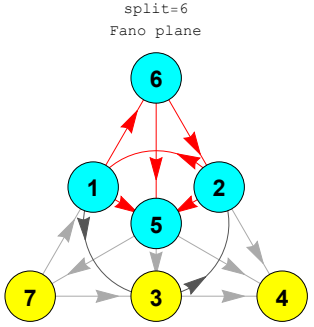
split=4

Fano plane



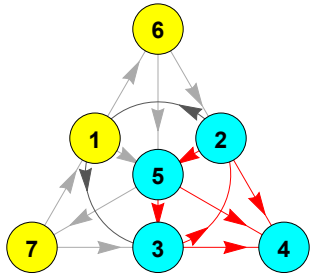
split=6

Fano plane



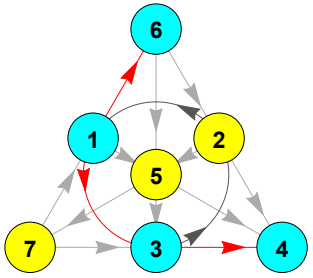
split=3

Fano plane



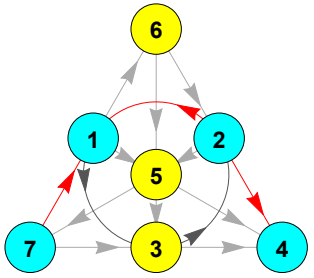
split=5

Fano plane



split=7

Fano plane

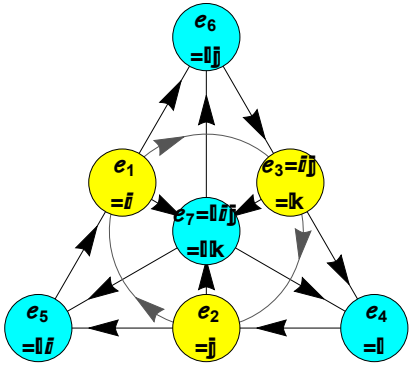


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
194	$\frac{\overline{e_T \phi}^{\,0}}{g_m}$		0apggsscc 011001010_2	Bn{ E8{	1 0	0 1	0 −1	1 0	1 0	1 0	1 0	0 0	} }	N 7

flip=False

{1, 3, 2}{1, 7, 4}{1, 6, 5}{2, 5, 4}{2, 7, 6}{3, 4, 6}{3, 7, 5}

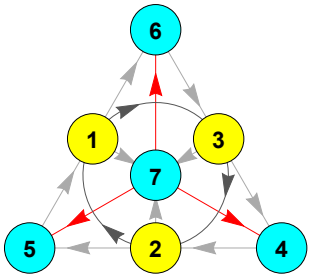
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	$-e_7$	$-e_6$	e_5	e_4
e_2	e_3	−1	$-e_1$	$-e_5$	e_4	$-e_7$	e_6
e_3	$-e_2$	e_1	−1	e_6	$-e_7$	$-e_4$	e_5
e_4	e_7	e_5	$-e_6$	−1	$-e_2$	e_3	$-e_1$
e_5	e_6	$-e_4$	e_7	e_2	−1	$-e_1$	$-e_3$
e_6	$-e_5$	e_7	e_4	$-e_3$	e_1	−1	$-e_2$
e_7	$-e_4$	$-e_6$	$-e_5$	e_1	e_3	e_2	−1

split=1

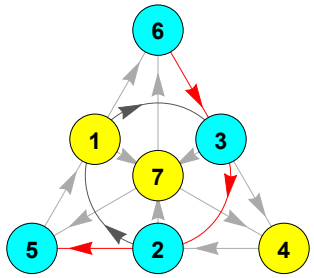
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−7	−6	5	4
2	3	−1	−1	−5	4	−7	6
3	−2	1	−1	6	−7	−4	5
4	7	5	−6	1	2	−3	1
5	6	−4	7	−2	1	1	3
6	−5	7	4	3	−1	1	2
7	−4	−6	−5	−1	−3	−2	1

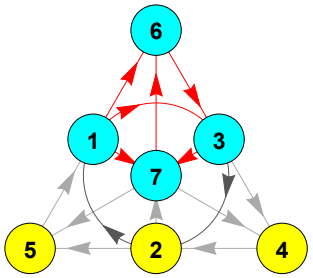
split=2

Fano plane



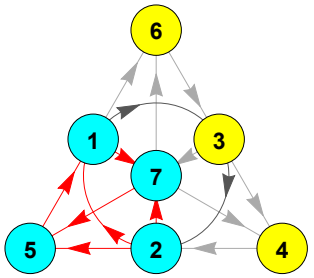
split=4

Fano plane



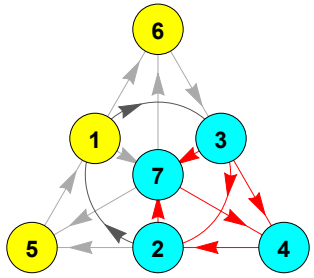
split=6

Fano plane



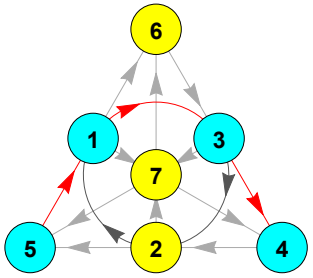
split=3

Fano plane



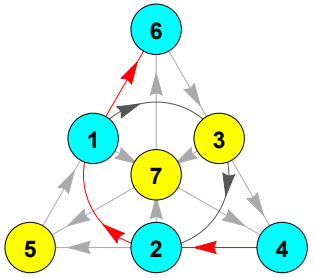
split=5

Fano plane



split=7

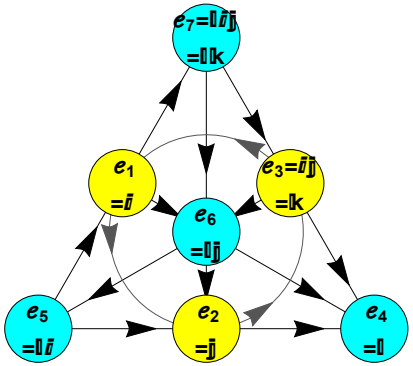
Fano plane



flip=True

{1, 2, 3}{1, 6, 4}{1, 7, 5}{2, 4, 5}{2, 7, 6}{3, 4, 7}{3, 6, 5}

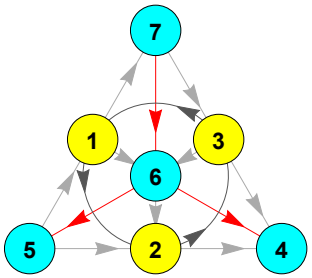
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	$-e_6$	$-e_7$	e_4	e_5
e_2	$-e_3$	−1	e_1	e_5	$-e_4$	$-e_7$	e_6
e_3	e_2	$-e_1$	−1	e_7	$-e_6$	e_5	$-e_4$
e_4	e_6	$-e_5$	$-e_7$	−1	e_2	$-e_1$	e_3
e_5	e_7	e_4	e_6	$-e_2$	−1	$-e_3$	$-e_1$
e_6	$-e_4$	e_7	$-e_5$	e_1	e_3	−1	$-e_2$
e_7	$-e_5$	$-e_6$	e_4	$-e_3$	e_1	e_2	−1

split=1

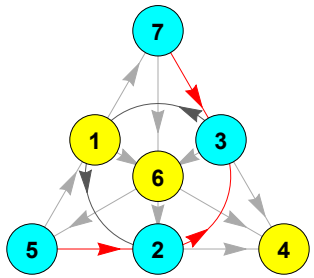
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−6	−7	4	5
2	−3	−1	1	5	−4	−7	6
3	2	−1	−1	7	−6	5	−4
4	6	−5	−7	1	−2	1	−3
5	7	4	6	2	1	3	1
6	−4	7	−5	−1	−3	1	2
7	−5	−6	4	3	−1	−2	1

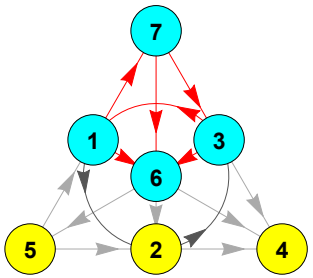
split=2

Fano plane



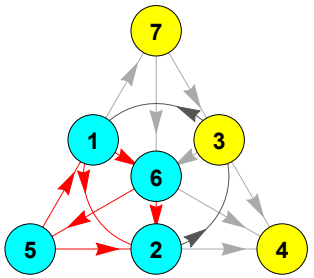
split=4

Fano plane



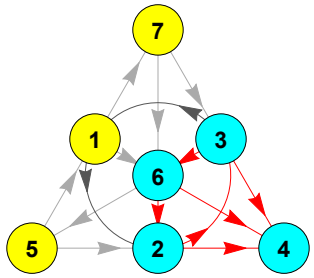
split=6

Fano plane



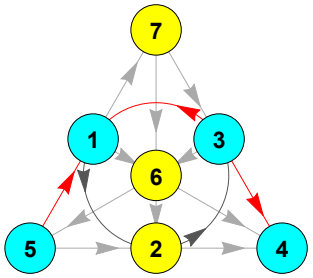
split=3

Fano plane



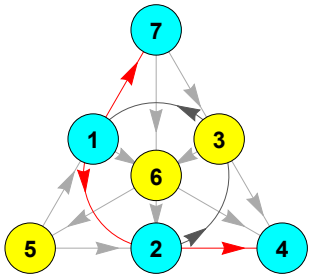
split=5

Fano plane



split=7

Fano plane

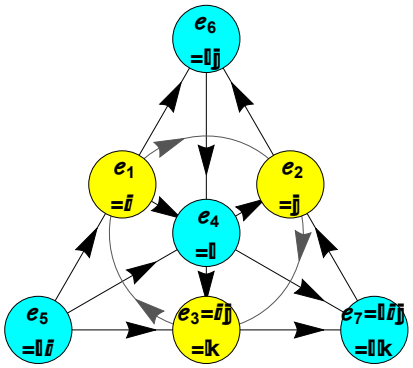


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates								Ele #
195	$\overline{e_{S\Phi}}^{0\to1}_{g_1}$		0apggsscc	Bn{	1	0	0	1	1	1	0	1 }	Si
			011000110_2	E8{	0	1	0	-1	0	0	0	0 }	14

flip=False

{1, 2, 3}{1, 4, 7}{1, 6, 5}{2, 5, 4}{2, 6, 7}{3, 6, 4}{3, 7, 5}

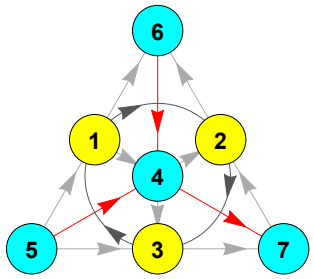
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_7	$-e_6$	e_5	$-e_4$
e_2	$-e_3$	-1	e_1	$-e_5$	e_4	e_7	$-e_6$
e_3	e_2	$-e_1$	-1	$-e_6$	$-e_7$	e_4	e_5
e_4	$-e_7$	e_5	e_6	-1	$-e_2$	$-e_3$	e_1
e_5	e_6	$-e_4$	e_7	e_2	-1	$-e_1$	$-e_3$
e_6	$-e_5$	$-e_7$	$-e_4$	e_3	e_1	-1	e_2
e_7	e_4	e_6	$-e_5$	$-e_1$	e_3	$-e_2$	-1

split=1

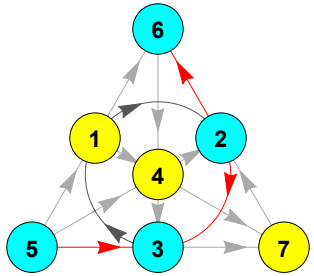
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	7	-6	5	-4
2	-3	-1	1	-5	4	7	-6
3	2	-1	-1	-6	-7	4	5
4	-7	5	6	1	2	3	-1
5	6	-4	7	-2	1	1	3
6	-5	-7	-4	-3	-1	1	-2
7	4	6	-5	1	-3	2	1

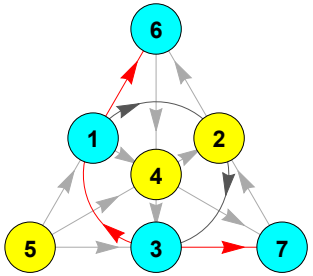
split=2

Fano plane



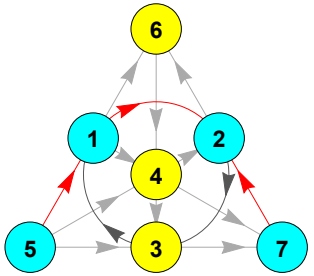
split=4

Fano plane



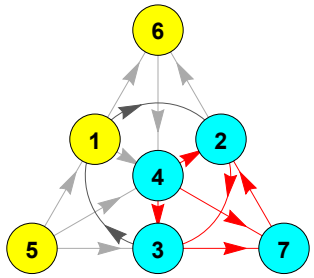
split=6

Fano plane



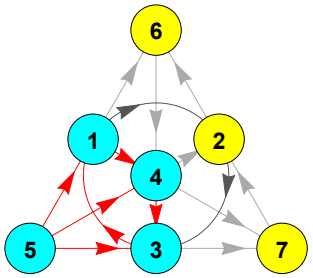
split=3

Fano plane



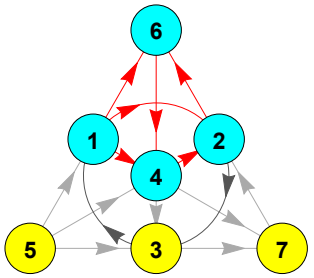
split=5

Fano plane



split=7

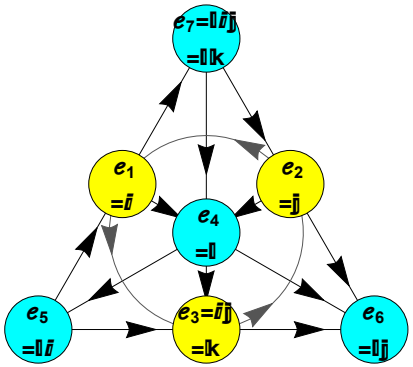
Fano plane



flip=True

{1, 3, 2}{1, 4, 6}{1, 7, 5}{2, 4, 5}{2, 6, 7}{3, 7, 4}{3, 6, 5}

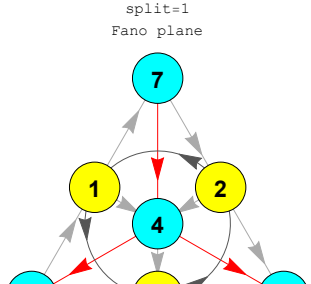
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	e_6	$-e_7$	$-e_4$	e_5
e_2	e_3	-1	$-e_1$	e_5	$-e_4$	e_7	$-e_6$
e_3	$-e_2$	e_1	-1	$-e_7$	$-e_6$	e_5	e_4
e_4	$-e_6$	$-e_5$	e_7	-1	e_2	e_1	$-e_3$
e_5	e_7	e_4	e_6	$-e_2$	-1	$-e_3$	$-e_1$
e_6	e_4	$-e_7$	$-e_5$	$-e_1$	e_3	-1	e_2
e_7	$-e_5$	e_6	$-e_4$	e_3	e_1	$-e_2$	-1

split=1

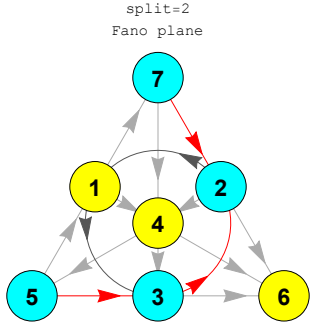
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	6	-7	-4	5
2	3	-1	-1	5	-4	7	-6
3	-2	1	-1	-7	-6	5	4
4	-6	-5	7	1	-2	-1	3
5	7	4	6	2	1	3	1
6	4	-7	-5	1	-3	1	-2
7	-5	6	-4	-3	-1	2	1

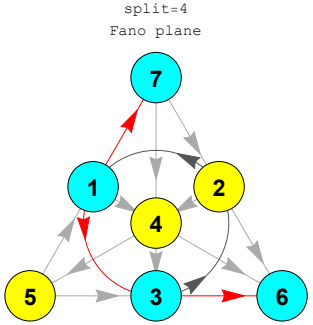
split=2

Fano plane



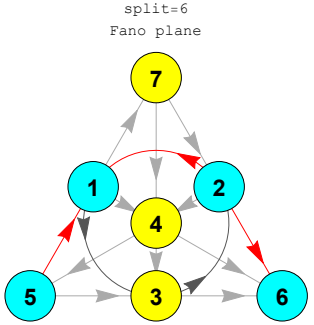
split=4

Fano plane



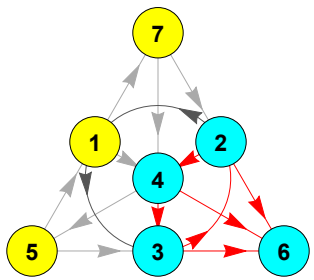
split=6

Fano plane



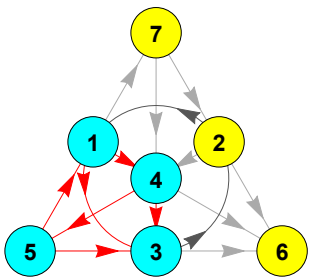
split=3

Fano plane



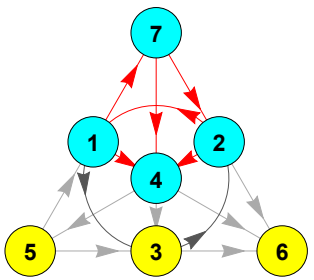
split=5

Fano plane



split=7

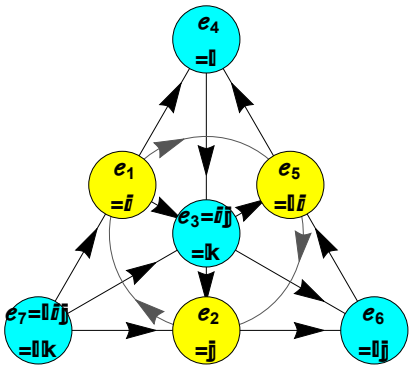
Fano plane



Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates								Ele #
196	$\sqrt{V_\mu}^{\,0}_{\mathrm{Wm}}$		0apggsscc 011101100_2	Bn{ E8{	1 0	0 1	0 0	1 0	1 −1	0 0	1 0	1 0	} }	Sc 21

flip=False

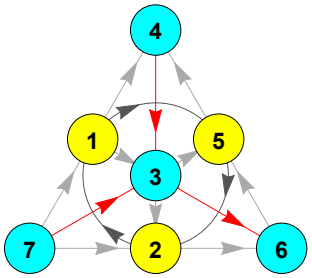
{1, 5, 2}{1, 3, 6}{1, 4, 7}{2, 4, 3}{2, 6, 7}{3, 5, 7}{4, 6, 5}



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	e_6	e_7	e_2	$-e_3$	$-e_4$
e_2	e_2	e_5	−1	$-e_4$	e_3	$-e_1$	e_7	$-e_6$
e_3	e_3	$-e_6$	e_4	−1	$-e_2$	e_7	e_1	$-e_5$
e_4	e_4	$-e_7$	$-e_3$	e_2	−1	$-e_6$	e_5	e_1
e_5	e_5	$-e_2$	e_1	$-e_7$	e_6	−1	$-e_4$	e_3
e_6	e_6	e_3	$-e_7$	$-e_1$	$-e_5$	e_4	−1	e_2
e_7	e_7	e_4	e_6	e_5	$-e_1$	$-e_3$	$-e_2$	−1

split=1

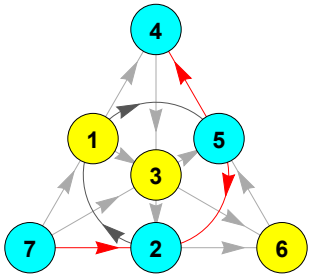
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	6	7	2	−3	−4
2	5	−1	−4	3	−1	7	−6
3	−6	4	1	2	7	−1	5
4	−7	−3	−2	1	−6	−5	−1
5	−2	1	−7	6	−1	−4	3
6	3	−7	1	5	4	1	−2
7	4	6	−5	1	−3	2	1

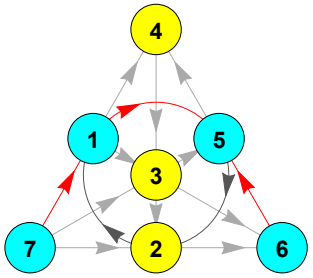
split=2

Fano plane



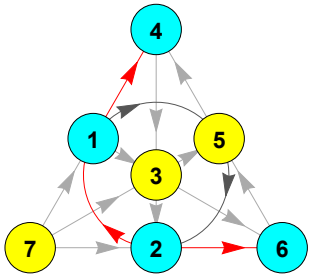
split=4

Fano plane



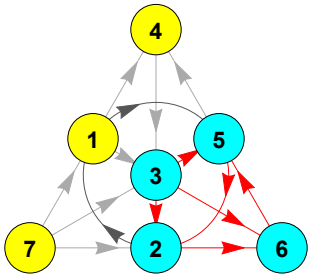
split=6

Fano plane



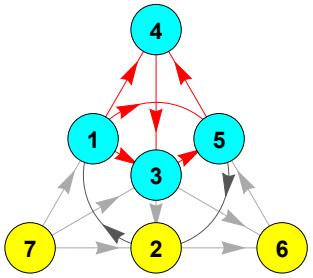
split=3

Fano plane



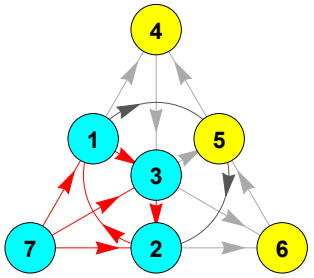
split=5

Fano plane



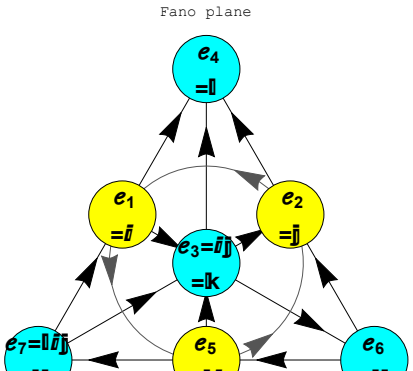
split=7

Fano plane



flip=True

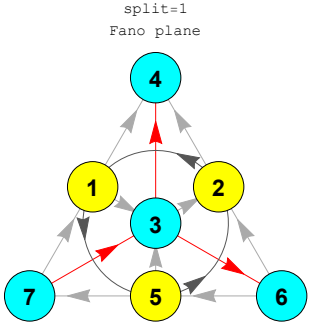
{1, 5, 2}{1, 3, 6}{1, 4, 7}{2, 7, 3}{2, 4, 6}{3, 4, 5}{5, 7, 6}



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	e_6	e_7	e_2	$-e_3$	$-e_4$
e_2	e_2	e_5	−1	$-e_7$	e_6	$-e_1$	$-e_4$	e_3
e_3	e_3	$-e_6$	e_7	−1	e_5	$-e_4$	e_1	$-e_2$
e_4	e_4	$-e_7$	$-e_6$	$-e_5$	−1	e_3	e_2	e_1
e_5	e_5	$-e_2$	e_1	e_4	$-e_3$	−1	$-e_7$	e_6
e_6	e_6	e_3	e_4	$-e_1$	$-e_2$	e_7	−1	$-e_5$
e_7	e_7	e_4	$-e_3$	e_2	$-e_1$	$-e_6$	e_5	−1

split=1

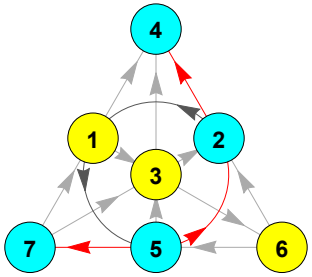
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	6	7	2	−3	−4
2	5	−1	−7	6	−1	−4	3
3	−6	7	1	−5	−4	−1	2
4	−7	−6	5	1	3	−2	−1
5	−2	1	4	−3	−1	−7	6
6	3	4	1	2	7	1	5
7	4	−3	−2	1	−6	−5	1

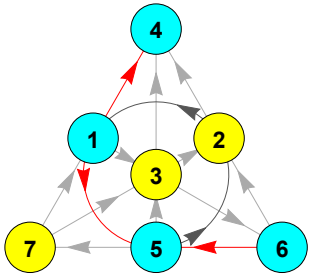
split=2

Fano plane



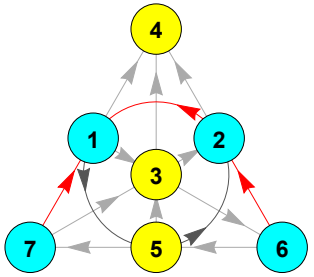
split=4

Fano plane



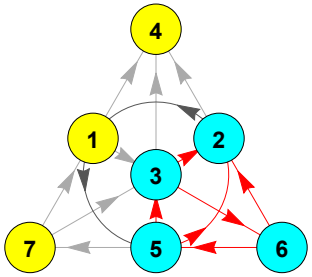
split=6

Fano plane



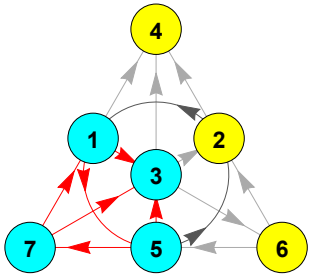
split=3

Fano plane



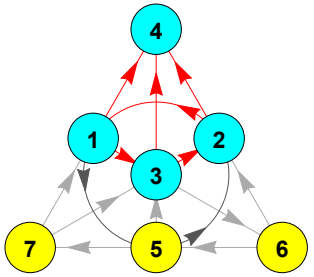
split=5

Fano plane



split=7

Fano plane

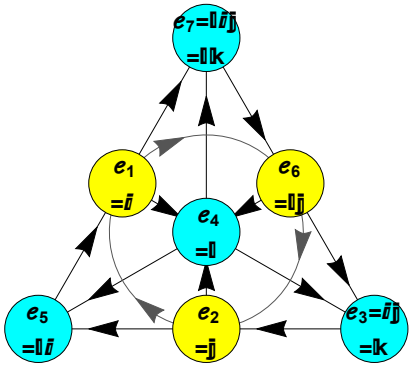


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
197	$s_{\bar{\Omega}\bar{m}}^{\rightarrow\rightarrow -1/3}$		0apggsscc 000101001_2	Bn{ E8{	1 0	0 1	0 0	1 0	0 0	1 -1	1 0	1 0	} }	Ni 28

flip=False

{1, 6, 2}{1, 4, 3}{1, 7, 5}{2, 5, 3}{2, 4, 7}{3, 7, 6}{4, 5, 6}

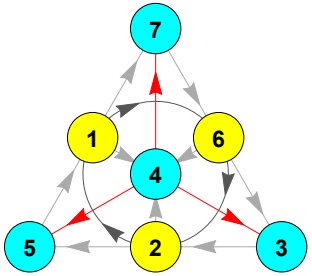
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_6$	$-e_4$	e_3	$-e_7$	e_2	e_5
e_2	e_6	-1	$-e_5$	e_7	e_3	$-e_1$	$-e_4$
e_3	e_4	e_5	-1	$-e_1$	$-e_2$	$-e_7$	e_6
e_4	$-e_3$	$-e_7$	e_1	-1	e_6	$-e_5$	e_2
e_5	e_7	$-e_3$	e_2	$-e_6$	-1	e_4	$-e_1$
e_6	$-e_2$	e_1	e_7	e_5	$-e_4$	-1	$-e_3$
e_7	$-e_5$	e_4	$-e_6$	$-e_2$	e_1	e_3	-1

split=1

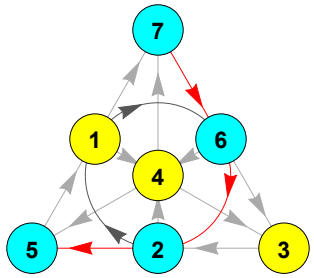
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	-4	3	-7	2	5
2	6	-1	-5	7	3	-1	-4
3	4	5	1	1	2	-7	-6
4	-3	-7	-1	1	-6	-5	-2
5	7	-3	-2	6	1	4	1
6	-2	1	7	5	-4	-1	-3
7	-5	4	6	2	-1	3	1

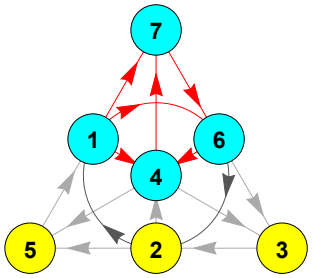
split=2

Fano plane



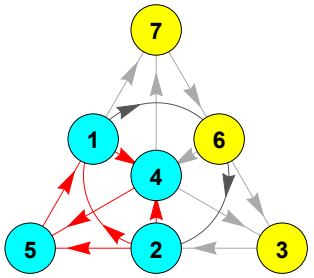
split=4

Fano plane



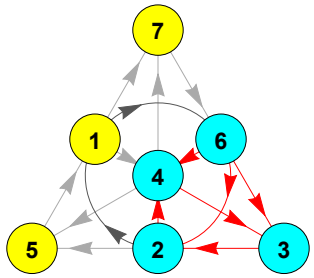
split=6

Fano plane



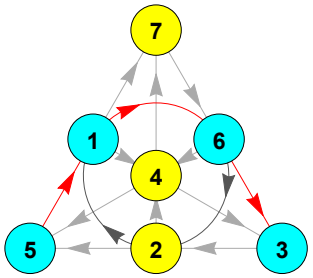
split=3

Fano plane



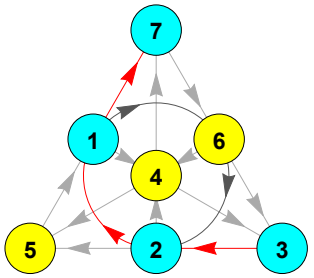
split=5

Fano plane



split=7

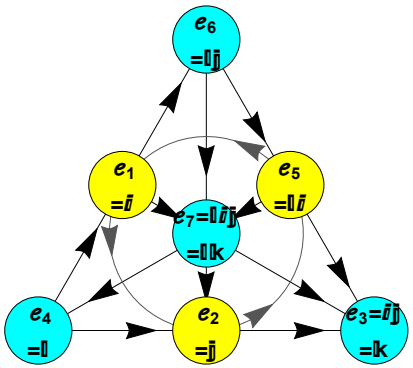
Fano plane



flip=True

{1, 2, 5}{1, 7, 3}{1, 6, 4}{2, 3, 4}{2, 6, 7}{3, 6, 5}{4, 5, 7}

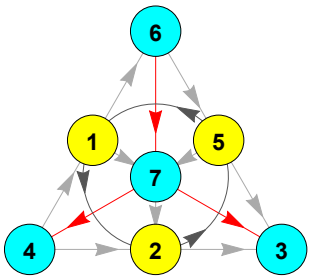
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	$-e_7$	$-e_6$	$-e_2$	e_4	e_3
e_2	$-e_5$	-1	e_4	$-e_3$	e_1	e_7	$-e_6$
e_3	e_7	$-e_4$	-1	e_2	$-e_6$	e_5	$-e_1$
e_4	e_6	e_3	$-e_2$	-1	e_7	$-e_1$	$-e_5$
e_5	e_2	$-e_1$	e_6	$-e_7$	-1	$-e_3$	e_4
e_6	$-e_4$	$-e_7$	$-e_5$	e_1	e_3	-1	e_2
e_7	$-e_3$	e_6	e_1	e_5	$-e_4$	$-e_2$	-1

split=1

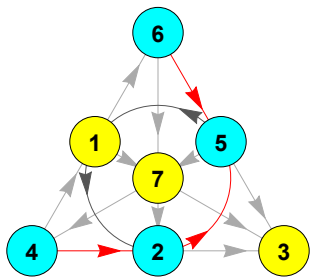
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	-7	-6	-2	4	3
2	-5	-1	4	-3	1	7	-6
3	7	-4	1	-2	-6	-5	1
4	6	3	2	1	7	1	5
5	2	-1	6	-7	-1	-3	4
6	-4	-7	5	-1	3	1	-2
7	-3	6	-1	-5	-4	2	1

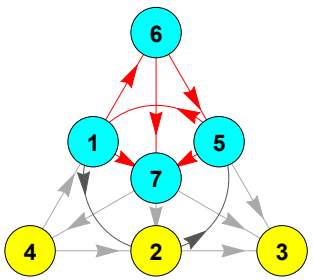
split=2

Fano plane



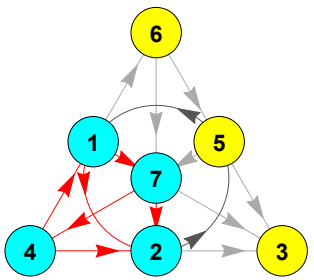
split=4

Fano plane



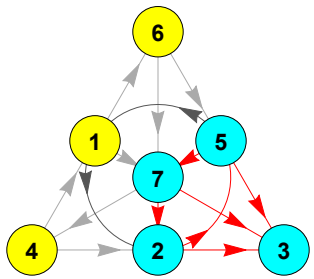
split=6

Fano plane



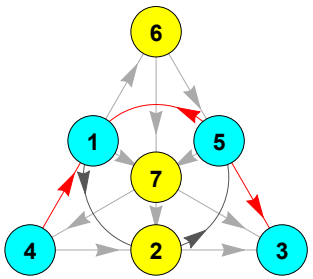
split=3

Fano plane



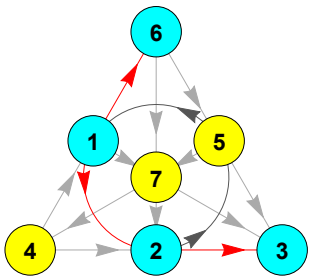
split=5

Fano plane



split=7

Fano plane

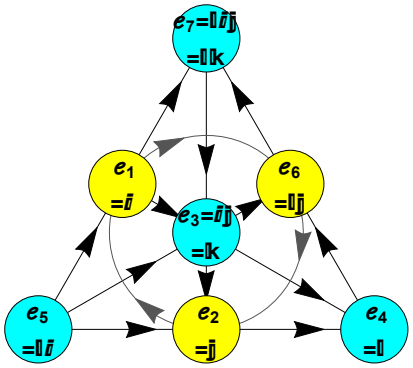


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
198	$S_{\bar{c}_m}^{\vec{t}^{\to -1/3}}$	■ ◆	0apggsscc 000101010_2	Bn{ E8{	1 0	0 1	0 0	0 0	1 0	1 0	1 −1	1 0	} }	Se 34

flip=False

{1, 6, 2}{1, 3, 4}{1, 7, 5}{2, 7, 3}{2, 4, 5}{3, 6, 5}{4, 6, 7}

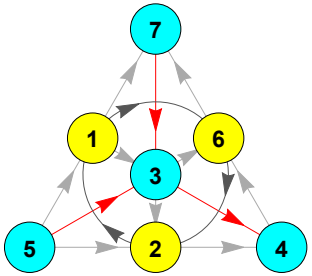
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	e_4	$-e_3$	$-e_7$	e_2	e_5
e_2	e_6	−1	$-e_7$	e_5	$-e_4$	$-e_1$	e_3
e_3	$-e_4$	e_7	−1	e_1	$-e_6$	e_5	$-e_2$
e_4	e_3	$-e_5$	$-e_1$	−1	e_2	e_7	$-e_6$
e_5	e_7	e_4	e_6	$-e_2$	−1	$-e_3$	$-e_1$
e_6	$-e_2$	e_1	$-e_5$	$-e_7$	e_3	−1	e_4
e_7	$-e_5$	$-e_3$	e_2	e_6	e_1	$-e_4$	−1

split=1

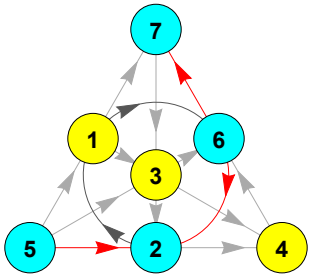
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	4	−3	−7	2	5
2	6	−1	−7	5	−4	−1	3
3	−4	7	1	−1	6	5	2
4	3	−5	1	1	−2	7	6
5	7	4	−6	2	1	−3	1
6	−2	1	−5	−7	3	−1	4
7	−5	−3	−2	−6	−1	−4	1

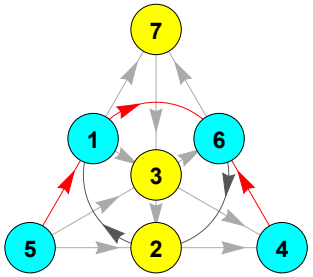
split=2

Fano plane



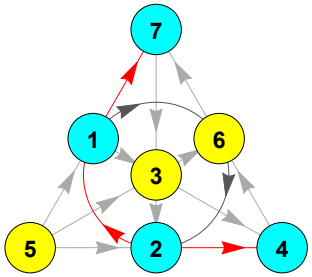
split=4

Fano plane



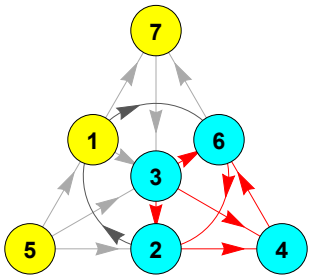
split=6

Fano plane



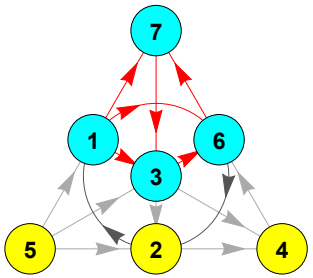
split=3

Fano plane



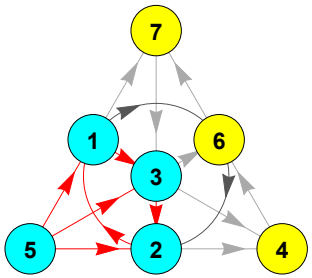
split=5

Fano plane



split=7

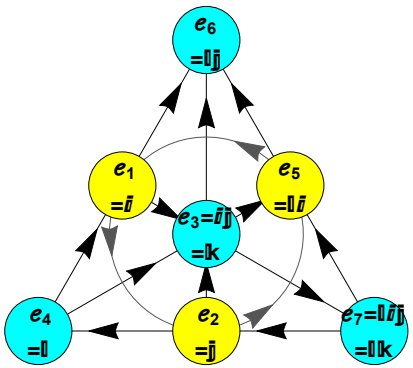
Fano plane



flip=True

{1, 2, 5}{1, 3, 7}{1, 6, 4}{2, 3, 6}{2, 4, 7}{3, 5, 4}{5, 6, 7}

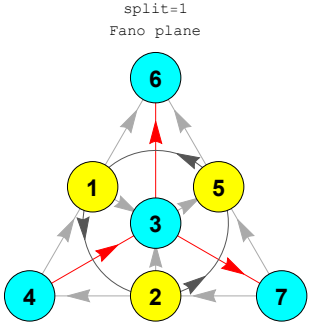
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_7	$-e_6$	$-e_2$	e_4	$-e_3$
e_2	$-e_5$	−1	e_6	e_7	e_1	$-e_3$	$-e_4$
e_3	$-e_7$	$-e_6$	−1	$-e_5$	e_4	e_2	e_1
e_4	e_6	$-e_7$	e_5	−1	$-e_3$	$-e_1$	e_2
e_5	e_2	$-e_1$	$-e_4$	e_3	−1	e_7	$-e_6$
e_6	$-e_4$	e_3	$-e_2$	e_1	$-e_7$	−1	e_5
e_7	e_3	e_4	$-e_1$	$-e_2$	e_6	$-e_5$	−1

split=1

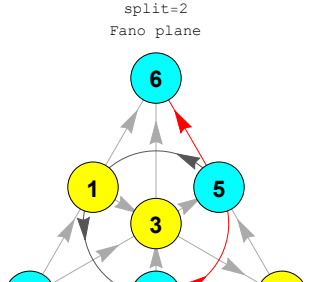
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	7	−6	−2	4	−3
2	−5	−1	6	7	1	−3	−4
3	−7	−6	1	5	4	−2	−1
4	6	−7	−5	1	−3	1	−2
5	2	−1	−4	3	−1	7	−6
6	−4	3	2	−1	−7	1	−5
7	3	4	1	2	6	5	1

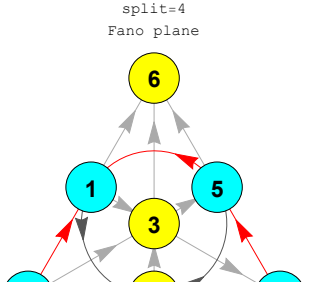
split=2

Fano plane



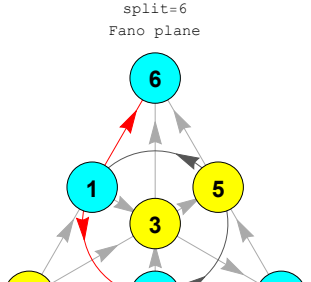
split=4

Fano plane



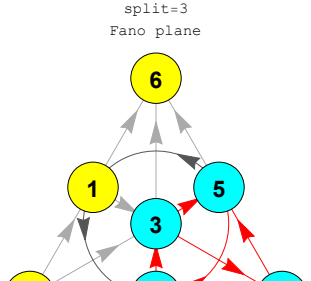
split=6

Fano plane



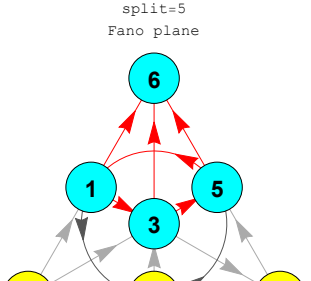
split=3

Fano plane



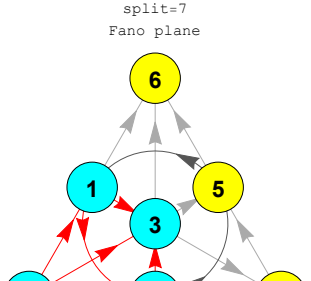
split=5

Fano plane



split=7

Fano plane

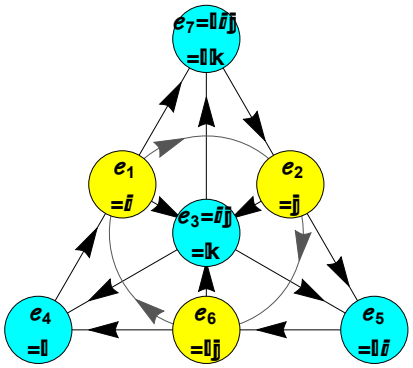


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits									Binary / E8 Coordinates		Ele #
199	$s_{m_e}^{-1/3}$	■ ◆	0apggsscc	Bn{	0	1	1	1	1	1	0	0	}	Uue
			000101011_2	E8{	0	1	0	0	0	0	0	-1	}	119

flip=False

{1, 2, 6}{1, 3, 5}{1, 7, 4}{2, 3, 4}{2, 5, 7}{3, 7, 6}{4, 5, 6}

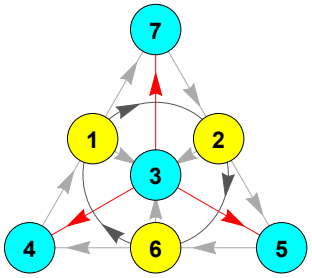
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	e_5	$-e_7$	$-e_3$	$-e_2$	e_4
e_2	$-e_6$	-1	e_4	$-e_3$	e_7	e_1	$-e_5$
e_3	$-e_5$	$-e_4$	-1	e_2	e_1	$-e_7$	e_6
e_4	e_7	e_3	$-e_2$	-1	e_6	$-e_5$	$-e_1$
e_5	e_3	$-e_7$	$-e_1$	$-e_6$	-1	e_4	e_2
e_6	e_2	$-e_1$	e_7	e_5	$-e_4$	-1	$-e_3$
e_7	$-e_4$	e_5	$-e_6$	e_1	$-e_2$	e_3	-1

split=1

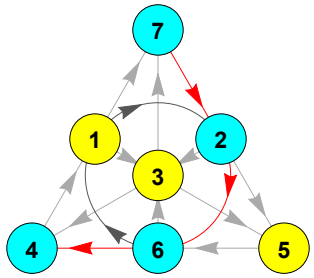
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	5	-7	-3	-2	4
2	-6	-1	4	-3	7	1	-5
3	-5	-4	1	-2	-1	-7	-6
4	7	3	2	1	-6	-5	1
5	3	-7	1	6	1	4	-2
6	2	-1	7	5	-4	-1	-3
7	-4	5	6	-1	2	3	1

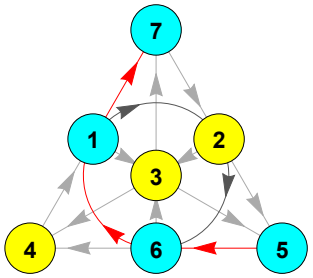
split=2

Fano plane



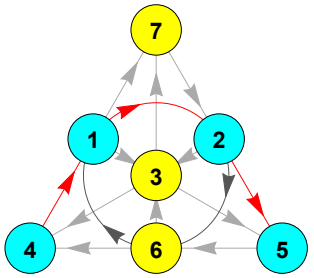
split=4

Fano plane



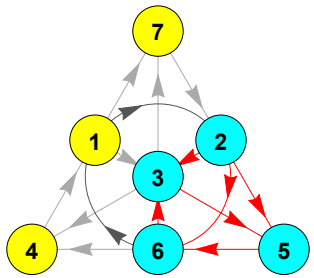
split=6

Fano plane



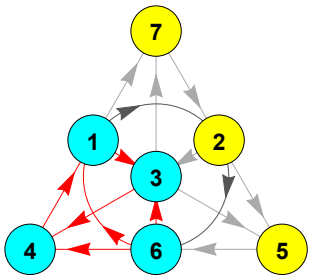
split=3

Fano plane



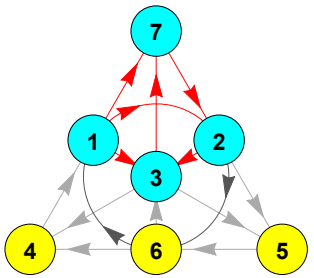
split=5

Fano plane



split=7

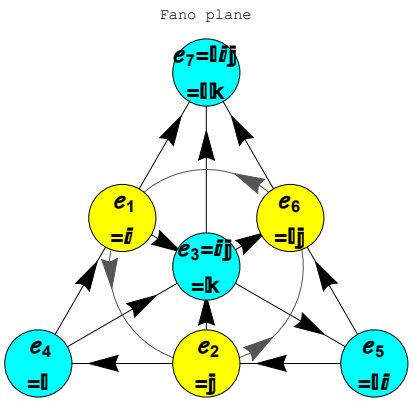
Fano plane



flip=True

{1, 2, 6}{1, 3, 5}{1, 7, 4}{2, 3, 7}{2, 4, 5}{3, 6, 4}{5, 6, 7}

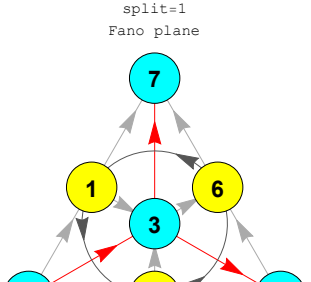
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	e_5	$-e_7$	$-e_3$	$-e_2$	e_4
e_2	$-e_6$	-1	e_7	e_5	$-e_4$	e_1	$-e_3$
e_3	$-e_5$	$-e_7$	-1	$-e_6$	e_1	e_4	e_2
e_4	e_7	$-e_5$	e_6	-1	e_2	$-e_3$	$-e_1$
e_5	e_3	e_4	$-e_1$	$-e_2$	-1	e_7	$-e_6$
e_6	e_2	$-e_1$	$-e_4$	e_3	$-e_7$	-1	e_5
e_7	$-e_4$	e_3	$-e_2$	e_1	e_6	$-e_5$	-1

split=1

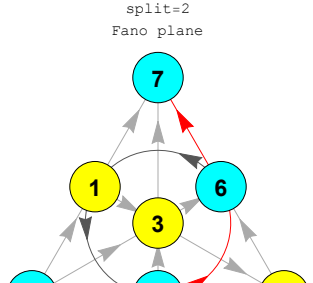
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	5	-7	-3	-2	4
2	-6	-1	7	5	-4	1	-3
3	-5	-7	1	6	-1	4	-2
4	7	-5	-6	1	-2	-3	1
5	3	4	1	2	1	7	6
6	2	-1	-4	3	-7	-1	5
7	-4	3	2	-1	-6	-5	1

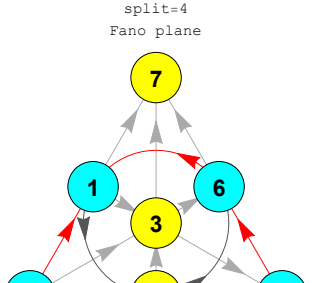
split=2

Fano plane



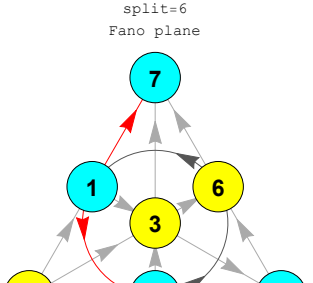
split=4

Fano plane



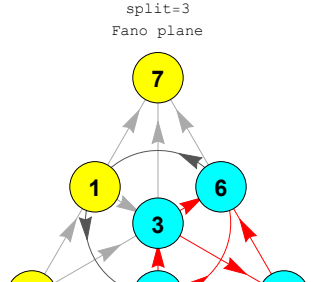
split=6

Fano plane



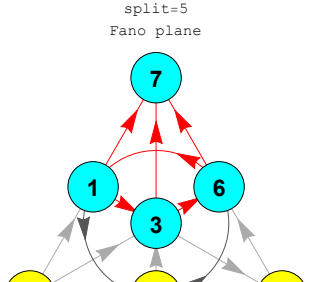
split=3

Fano plane



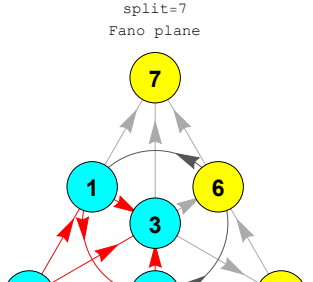
split=5

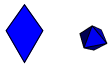
Fano plane



split=7

Fano plane

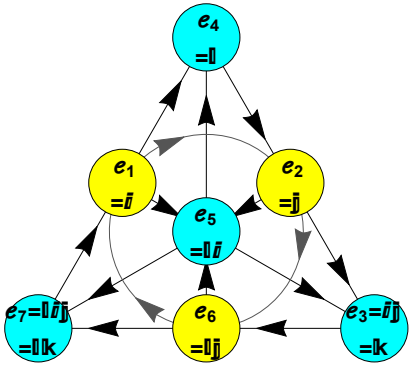


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
200	$\overline{\underset{b_m}{C}}^{-2/3\to 1/3}$		0apggsscc 011101111_2	Bn{ E8{	0 0	1 1	1 0	1 0	1 0	0 0	1 0	0 1	} }	$\overline{Md}$ 101

flip=False

{1, 2, 6}{1, 5, 3}{1, 4, 7}{2, 3, 4}{2, 5, 7}{3, 6, 7}{4, 6, 5}

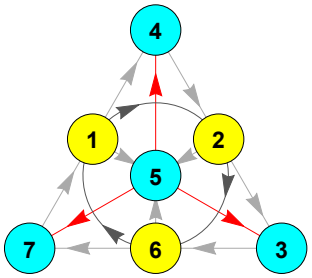
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_5$	e_7	e_3	$-e_2$	$-e_4$
e_2	$-e_6$	−1	e_4	$-e_3$	e_7	e_1	$-e_5$
e_3	e_5	$-e_4$	−1	e_2	$-e_1$	e_7	$-e_6$
e_4	$-e_7$	e_3	$-e_2$	−1	$-e_6$	e_5	e_1
e_5	$-e_3$	$-e_7$	e_1	e_6	−1	$-e_4$	e_2
e_6	e_2	$-e_1$	$-e_7$	$-e_5$	e_4	−1	e_3
e_7	e_4	e_5	e_6	$-e_1$	$-e_2$	$-e_3$	−1

split=1

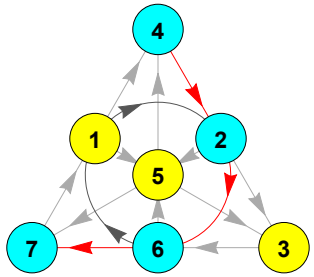
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−5	7	3	−2	−4
2	−6	−1	4	−3	7	1	−5
3	5	−4	1	−2	1	7	6
4	−7	3	2	1	6	5	−1
5	−3	−7	−1	−6	1	−4	−2
6	2	−1	−7	−5	4	−1	3
7	4	5	−6	1	2	−3	1

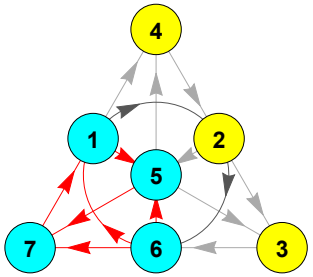
split=2

Fano plane



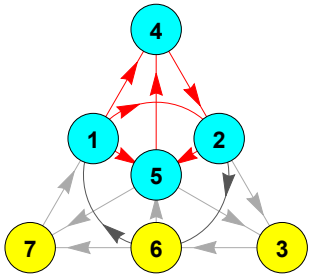
split=4

Fano plane



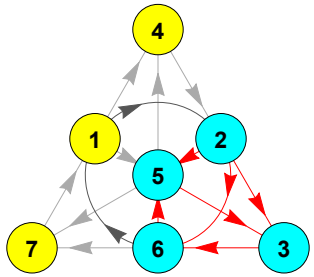
split=6

Fano plane



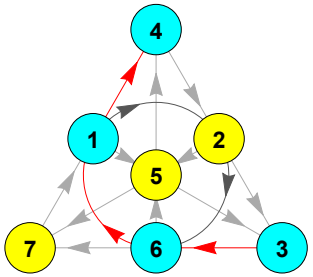
split=3

Fano plane



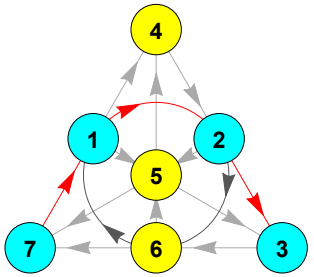
split=5

Fano plane



split=7

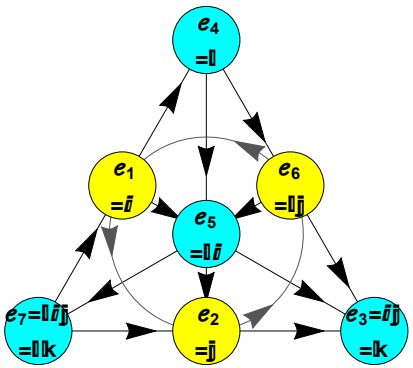
Fano plane



flip=True

{1, 2, 6}{1, 5, 3}{1, 4, 7}{2, 3, 7}{2, 4, 5}{3, 4, 6}{5, 7, 6}

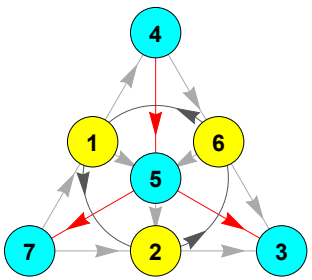
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_5$	e_7	e_3	$-e_2$	$-e_4$
e_2	$-e_6$	−1	e_7	e_5	$-e_4$	e_1	$-e_3$
e_3	e_5	$-e_7$	−1	e_6	$-e_1$	$-e_4$	e_2
e_4	$-e_7$	$-e_5$	$-e_6$	−1	e_2	e_3	e_1
e_5	$-e_3$	e_4	e_1	$-e_2$	−1	$-e_7$	e_6
e_6	e_2	$-e_1$	e_4	$-e_3$	e_7	−1	$-e_5$
e_7	e_4	e_3	$-e_2$	$-e_1$	$-e_6$	e_5	−1

split=1

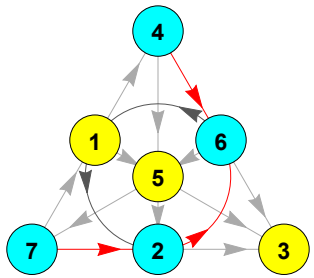
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−5	7	3	−2	−4
2	−6	−1	7	5	−4	1	−3
3	5	−7	1	−6	1	−4	−2
4	−7	−5	6	1	−2	3	−1
5	−3	4	−1	2	1	−7	−6
6	2	−1	4	−3	7	−1	−5
7	4	3	2	1	6	5	1

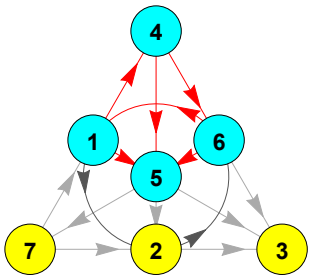
split=2

Fano plane



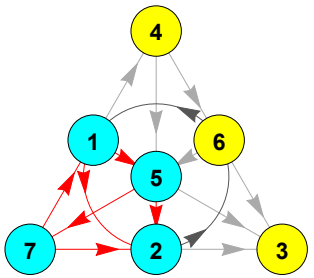
split=4

Fano plane



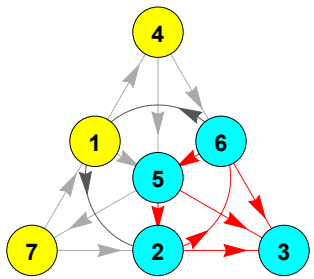
split=6

Fano plane



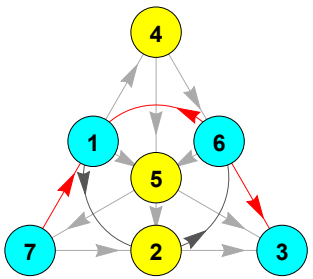
split=3

Fano plane



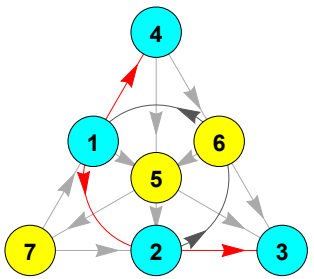
split=5

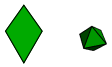
Fano plane



split=7

Fano plane

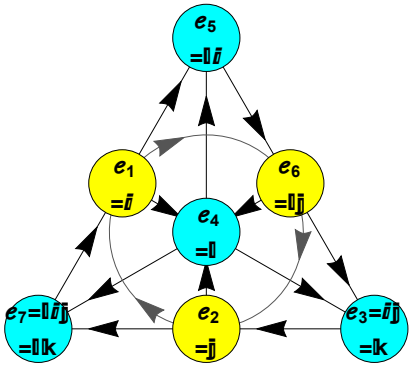


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits									Binary / E8 Coordinates									Ele #
201	$\overline{C}_{gm}^{0\mapsto 1/3}$		0apggsscc	Bn{	0	1	1	1	1	0	0	1	}	Br
			011101110_2	E8{	0	1	0	0	0	0	1	0	}	35

flip=False

{1, 6, 2}{1, 4, 3}{1, 5, 7}{2, 7, 3}{2, 4, 5}{3, 5, 6}{4, 7, 6}

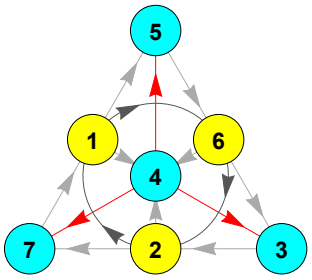
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_4$	e_3	e_7	e_2	$-e_5$
e_2	e_6	−1	$-e_7$	e_5	$-e_4$	$-e_1$	e_3
e_3	e_4	e_7	−1	$-e_1$	e_6	$-e_5$	$-e_2$
e_4	$-e_3$	$-e_5$	e_1	−1	e_2	$-e_7$	e_6
e_5	$-e_7$	e_4	$-e_6$	$-e_2$	−1	e_3	e_1
e_6	$-e_2$	e_1	e_5	e_7	$-e_3$	−1	$-e_4$
e_7	e_5	$-e_3$	e_2	$-e_6$	$-e_1$	e_4	−1

split=1

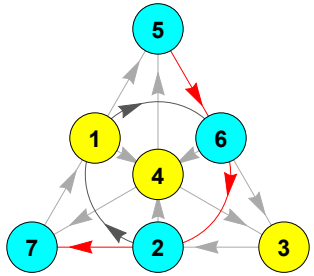
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−4	3	7	2	−5
2	6	−1	−7	5	−4	−1	3
3	4	7	1	1	−6	−5	2
4	−3	−5	−1	1	−2	−7	−6
5	−7	4	6	2	1	3	−1
6	−2	1	5	7	−3	−1	−4
7	5	−3	−2	6	1	4	1

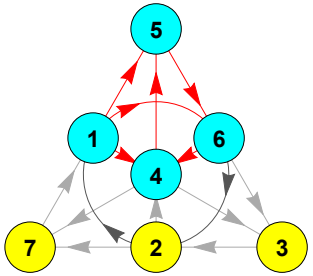
split=2

Fano plane



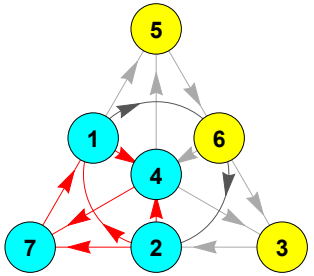
split=4

Fano plane



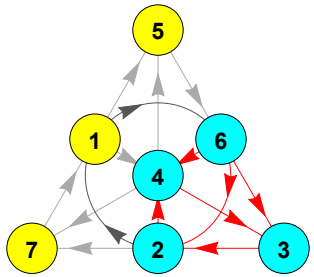
split=6

Fano plane



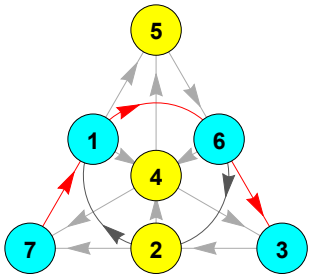
split=3

Fano plane



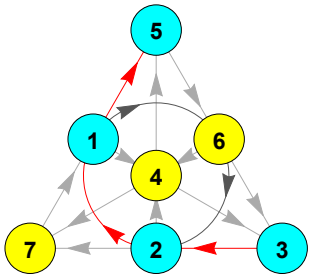
split=5

Fano plane



split=7

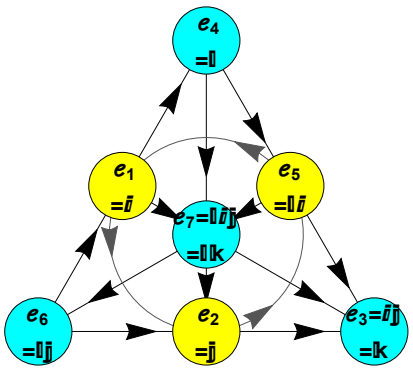
Fano plane



flip=True

{1, 2, 5}{1, 7, 3}{1, 4, 6}{2, 3, 6}{2, 4, 7}{3, 4, 5}{5, 7, 6}

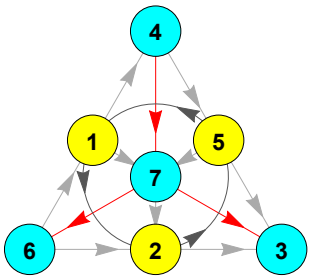
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	$-e_7$	e_6	$-e_2$	$-e_4$	e_3
e_2	$-e_5$	−1	e_6	e_7	e_1	$-e_3$	$-e_4$
e_3	e_7	$-e_6$	−1	e_5	$-e_4$	e_2	$-e_1$
e_4	$-e_6$	$-e_7$	$-e_5$	−1	e_3	e_1	e_2
e_5	e_2	$-e_1$	e_4	$-e_3$	−1	$-e_7$	e_6
e_6	e_4	e_3	$-e_2$	$-e_1$	e_7	−1	$-e_5$
e_7	$-e_3$	e_4	e_1	$-e_2$	$-e_6$	e_5	−1

split=1

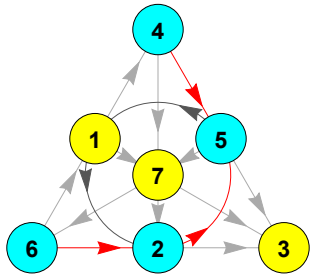
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−7	6	−2	−4	3
2	−5	−1	6	7	1	−3	−4
3	7	−6	1	−5	−4	−2	1
4	−6	−7	5	1	3	−1	−2
5	2	−1	4	−3	−1	−7	6
6	4	3	2	1	7	1	5
7	−3	4	−1	2	−6	−5	1

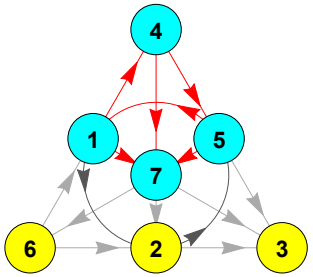
split=2

Fano plane



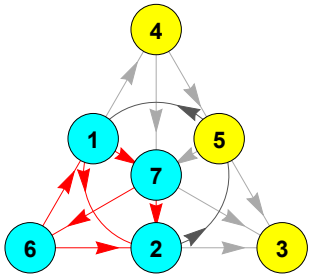
split=4

Fano plane



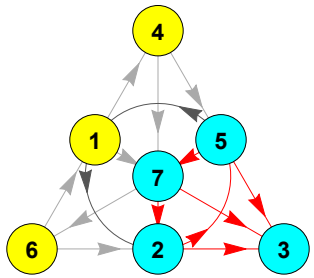
split=6

Fano plane



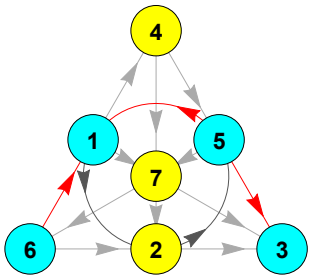
split=3

Fano plane



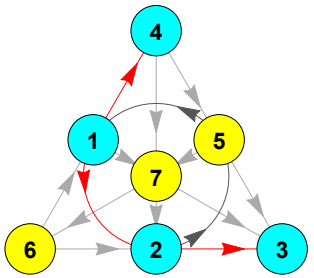
split=5

Fano plane



split=7

Fano plane

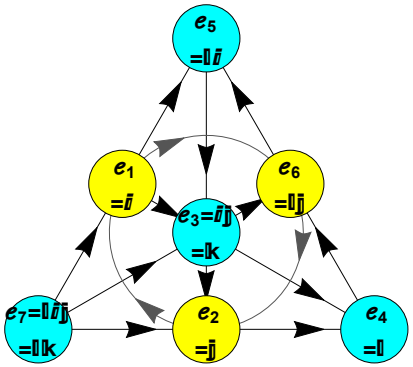


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
202	$\overline{\underset{rm}{C}}^{0\mapsto 1/3}_{R}$		0apggsscc	Bn{	0	1	1	1	0	1	1	0	}	Zr
			011101101_2	E8{	0	1	0	0	0	1	0	0	}	40

flip=False

{1, 6, 2}{1, 3, 4}{1, 5, 7}{2, 5, 3}{2, 4, 7}{3, 6, 7}{4, 6, 5}

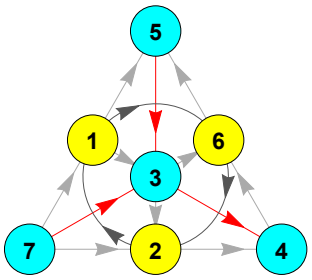
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_6$	e_4	$-e_3$	e_7	e_2	$-e_5$
e_2	e_6	-1	$-e_5$	e_7	e_3	$-e_1$	$-e_4$
e_3	$-e_4$	e_5	-1	e_1	$-e_2$	e_7	$-e_6$
e_4	e_3	$-e_7$	$-e_1$	-1	$-e_6$	e_5	e_2
e_5	$-e_7$	$-e_3$	e_2	e_6	-1	$-e_4$	e_1
e_6	$-e_2$	e_1	$-e_7$	$-e_5$	e_4	-1	e_3
e_7	e_5	e_4	e_6	$-e_2$	$-e_1$	$-e_3$	-1

split=1

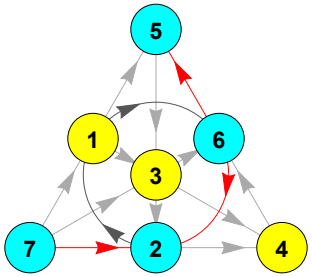
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-6	4	-3	7	2	-5
2	6	-1	-5	7	3	-1	-4
3	-4	5	1	-1	2	7	6
4	3	-7	1	1	6	5	-2
5	-7	-3	-2	-6	1	-4	-1
6	-2	1	-7	-5	4	-1	3
7	5	4	-6	2	1	-3	1

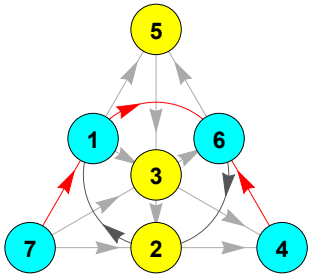
split=2

Fano plane



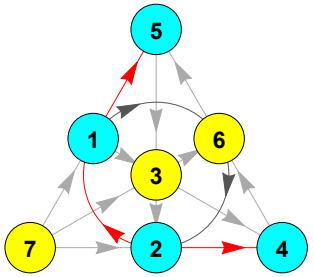
split=4

Fano plane



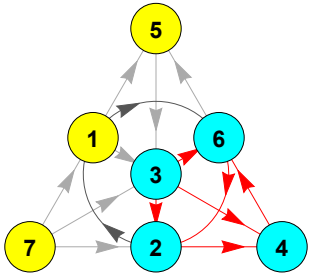
split=6

Fano plane



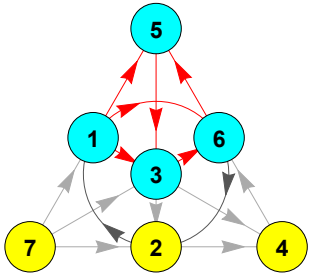
split=3

Fano plane



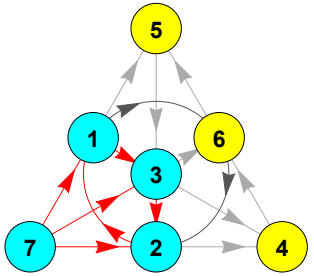
split=5

Fano plane



split=7

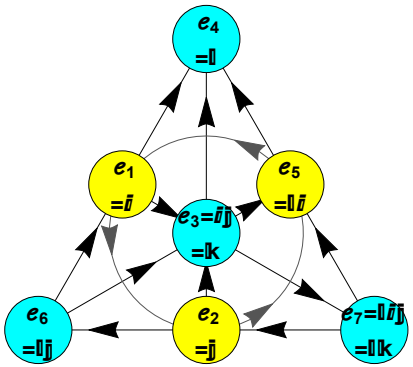
Fano plane



flip=True

{1, 2, 5}{1, 3, 7}{1, 4, 6}{2, 3, 4}{2, 6, 7}{3, 5, 6}{4, 7, 5}

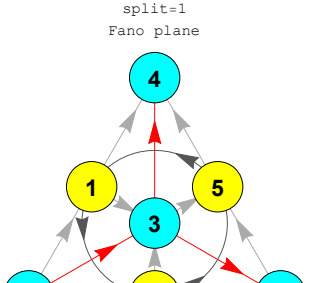
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	e_7	e_6	$-e_2$	$-e_4$	$-e_3$
e_2	$-e_5$	-1	e_4	$-e_3$	e_1	e_7	$-e_6$
e_3	$-e_7$	$-e_4$	-1	e_2	e_6	$-e_5$	e_1
e_4	$-e_6$	e_3	$-e_2$	-1	$-e_7$	e_1	e_5
e_5	e_2	$-e_1$	$-e_6$	e_7	-1	e_3	$-e_4$
e_6	e_4	$-e_7$	e_5	$-e_1$	$-e_3$	-1	e_2
e_7	e_3	e_6	$-e_1$	$-e_5$	e_4	$-e_2$	-1

split=1

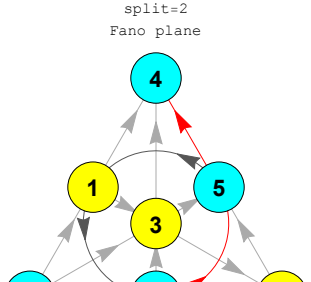
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	5	7	6	-2	-4	-3
2	-5	-1	4	-3	1	7	-6
3	-7	-4	1	-2	6	5	-1
4	-6	3	2	1	-7	-1	-5
5	2	-1	-6	7	-1	3	-4
6	4	-7	-5	1	-3	1	-2
7	3	6	1	5	4	2	1

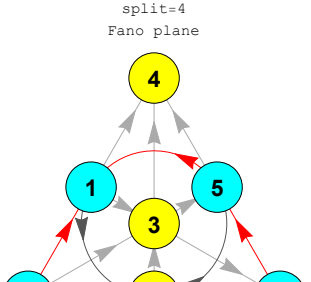
split=2

Fano plane



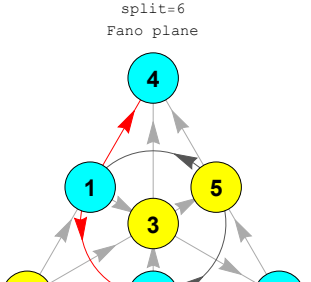
split=4

Fano plane



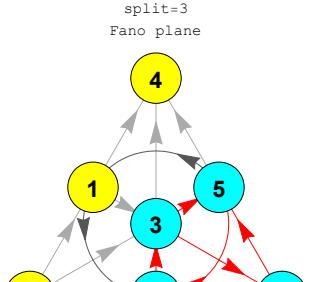
split=6

Fano plane



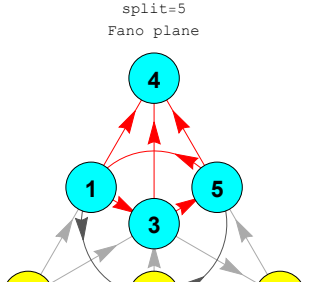
split=3

Fano plane



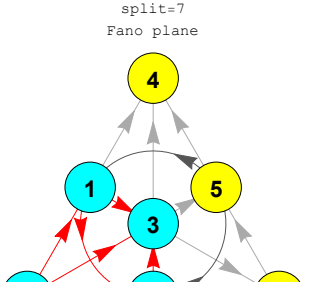
split=5

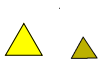
Fano plane



split=7

Fano plane

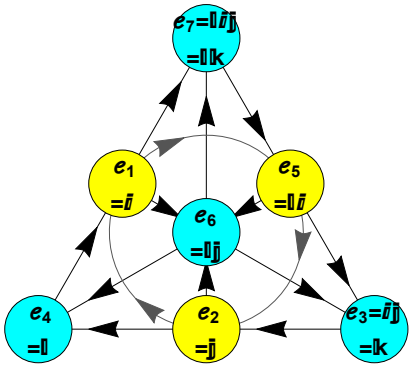


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits			Binary / E8 Coordinates								Ele #
203	$\overset{\mu}{\gamma_m}\overset{\to 0}{t}$		0apggsscc	Bn{	0	1	1	1	0	1	0	1	}	Ag
			000101000_2	E8{	0	1	0	0	1	0	0	0	}	47

flip=False

{1, 5, 2}{1, 6, 3}{1, 7, 4}{2, 4, 3}{2, 6, 7}{3, 7, 5}{4, 5, 6}

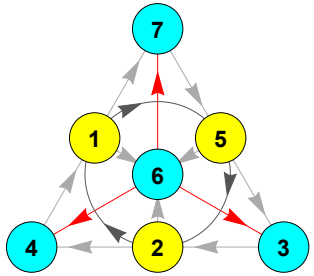
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_6$	$-e_7$	e_2	e_3	e_4
e_2	e_5	−1	$-e_4$	e_3	$-e_1$	e_7	$-e_6$
e_3	e_6	e_4	−1	$-e_2$	$-e_7$	$-e_1$	e_5
e_4	e_7	$-e_3$	e_2	−1	e_6	$-e_5$	$-e_1$
e_5	$-e_2$	e_1	e_7	$-e_6$	−1	e_4	$-e_3$
e_6	$-e_3$	$-e_7$	e_1	e_5	$-e_4$	−1	e_2
e_7	$-e_4$	e_6	$-e_5$	e_1	e_3	$-e_2$	−1

split=1

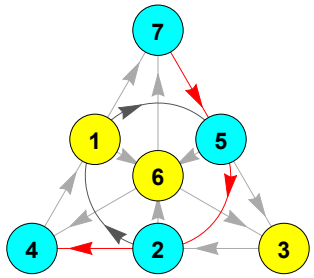
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−6	−7	2	3	4
2	5	−1	−4	3	−1	7	−6
3	6	4	1	2	−7	1	−5
4	7	−3	−2	1	6	5	1
5	−2	1	7	−6	−1	4	−3
6	−3	−7	−1	−5	−4	1	−2
7	−4	6	5	−1	3	2	1

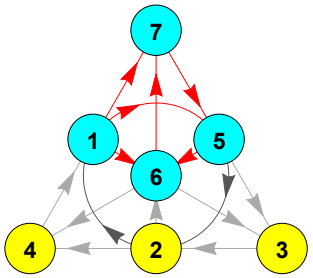
split=2

Fano plane



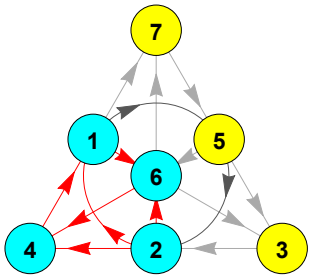
split=4

Fano plane



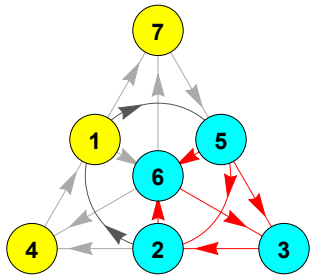
split=6

Fano plane



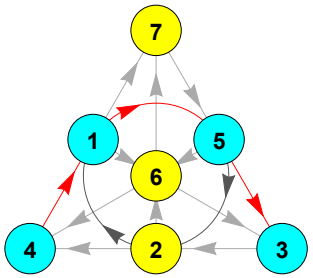
split=3

Fano plane



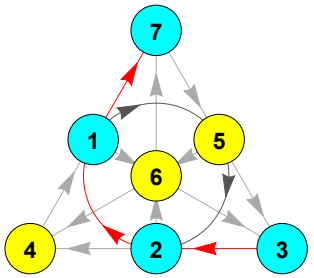
split=5

Fano plane



split=7

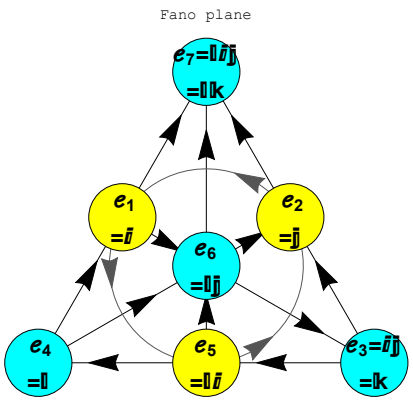
Fano plane



flip=True

{1, 5, 2}{1, 6, 3}{1, 7, 4}{2, 7, 3}{2, 4, 6}{3, 5, 4}{5, 6, 7}

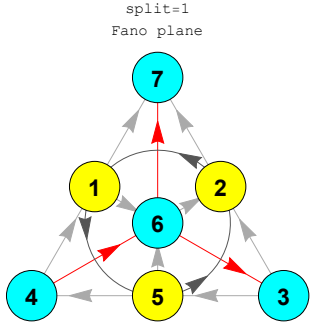
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_6$	$-e_7$	e_2	e_3	e_4
e_2	e_5	−1	$-e_7$	e_6	$-e_1$	$-e_4$	e_3
e_3	e_6	e_7	−1	$-e_5$	e_4	$-e_1$	$-e_2$
e_4	e_7	$-e_6$	e_5	−1	$-e_3$	e_2	$-e_1$
e_5	$-e_2$	e_1	$-e_4$	e_3	−1	e_7	$-e_6$
e_6	$-e_3$	e_4	e_1	$-e_2$	$-e_7$	−1	e_5
e_7	$-e_4$	$-e_3$	e_2	e_1	e_6	$-e_5$	−1

split=1

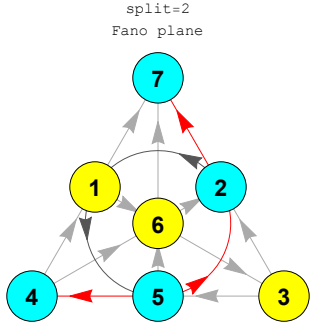
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−6	−7	2	3	4
2	5	−1	−7	6	−1	−4	3
3	6	7	1	5	4	1	2
4	7	−6	−5	1	−3	−2	1
5	−2	1	−4	3	−1	7	−6
6	−3	4	−1	2	−7	1	−5
7	−4	−3	−2	−1	6	5	1

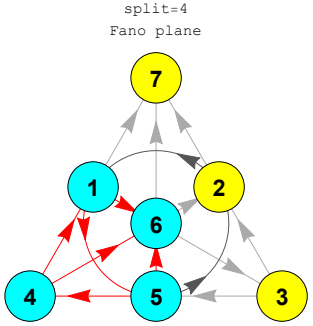
split=2

Fano plane



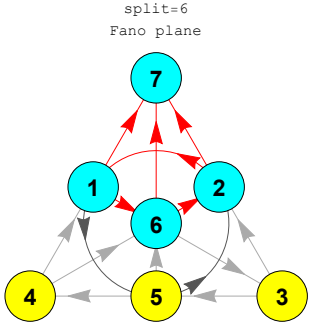
split=4

Fano plane



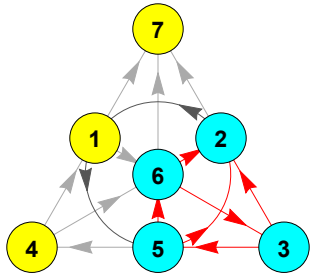
split=6

Fano plane



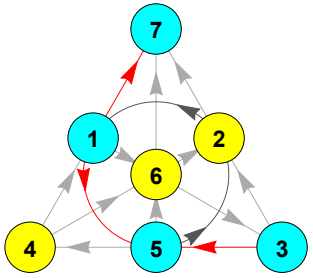
split=3

Fano plane



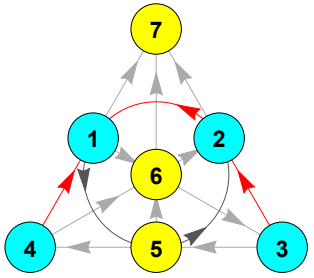
split=5

Fano plane



split=7

Fano plane

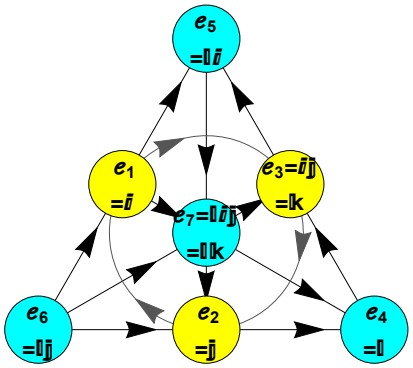


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates									Ele #
204	$B_{bm}^{0\mapsto -1}$		0apggsscc	Bn{	0	1	1	1	0	0	1	1	}	Xe
			001001011_2	E8{	0	1	0	1	0	0	0	0	}	54

flip=False

{1, 3, 2}{1, 7, 4}{1, 5, 6}{2, 4, 6}{2, 5, 7}{3, 5, 4}{3, 6, 7}

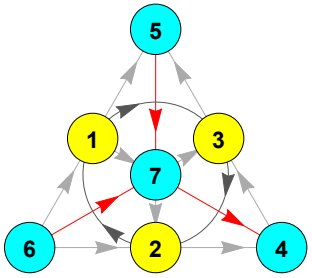
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	$-e_7$	e_6	$-e_5$	e_4
e_2	e_3	−1	$-e_1$	e_6	e_7	$-e_4$	$-e_5$
e_3	$-e_2$	e_1	−1	$-e_5$	e_4	e_7	$-e_6$
e_4	e_7	$-e_6$	e_5	−1	$-e_3$	e_2	$-e_1$
e_5	$-e_6$	$-e_7$	$-e_4$	e_3	−1	e_1	e_2
e_6	e_5	e_4	$-e_7$	$-e_2$	$-e_1$	−1	e_3
e_7	$-e_4$	e_5	e_6	e_1	$-e_2$	$-e_3$	−1

split=1

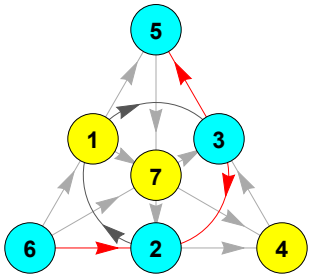
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−7	6	−5	4
2	3	−1	−1	6	7	−4	−5
3	−2	1	−1	−5	4	7	−6
4	7	−6	5	1	3	−2	1
5	−6	−7	−4	−3	1	−1	−2
6	5	4	−7	2	1	1	−3
7	−4	5	6	−1	2	3	1

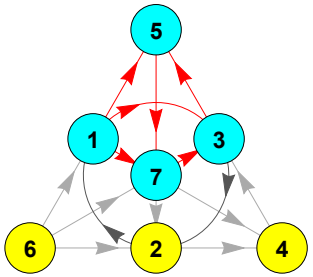
split=2

Fano plane



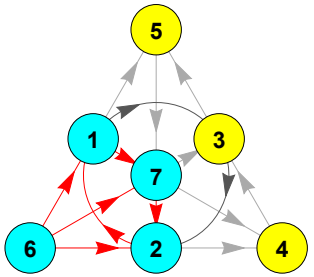
split=4

Fano plane



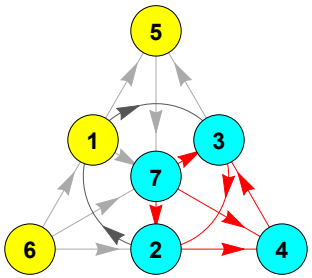
split=6

Fano plane



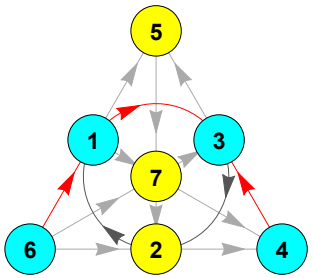
split=3

Fano plane



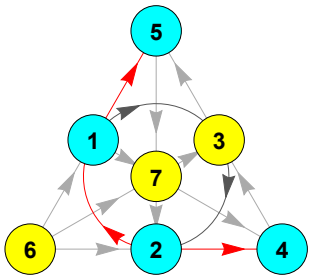
split=5

Fano plane



split=7

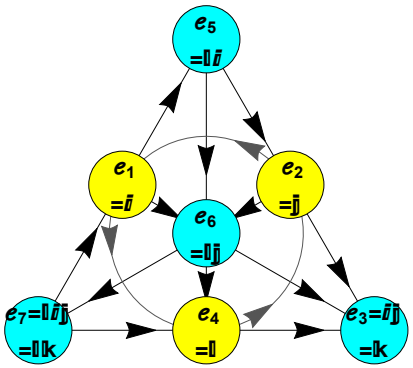
Fano plane



flip=True

{1, 4, 2}{1, 6, 3}{1, 5, 7}{2, 3, 5}{2, 6, 7}{3, 7, 4}{4, 5, 6}

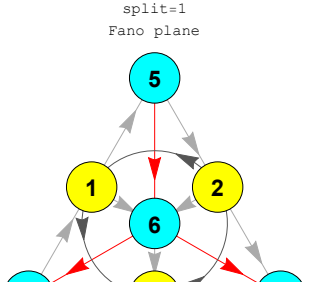
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_6$	e_2	e_7	e_3	$-e_5$
e_2	e_4	−1	e_5	$-e_1$	$-e_3$	e_7	$-e_6$
e_3	e_6	$-e_5$	−1	$-e_7$	e_2	$-e_1$	e_4
e_4	$-e_2$	e_1	e_7	−1	e_6	$-e_5$	$-e_3$
e_5	$-e_7$	e_3	$-e_2$	$-e_6$	−1	e_4	e_1
e_6	$-e_3$	$-e_7$	e_1	e_5	$-e_4$	−1	e_2
e_7	e_5	e_6	$-e_4$	e_3	$-e_1$	$-e_2$	−1

split=1

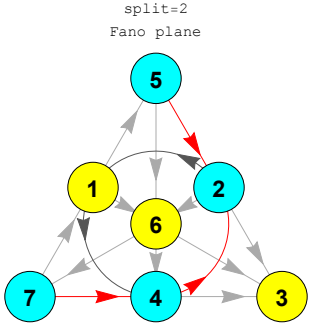
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−6	2	7	3	−5
2	4	−1	5	−1	−3	7	−6
3	6	−5	1	−7	−2	1	−4
4	−2	1	7	−1	6	−5	−3
5	−7	3	2	−6	1	−4	−1
6	−3	−7	−1	5	4	1	−2
7	5	6	4	3	1	2	1

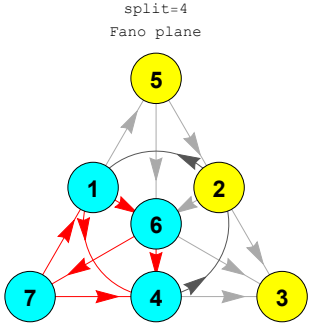
split=2

Fano plane



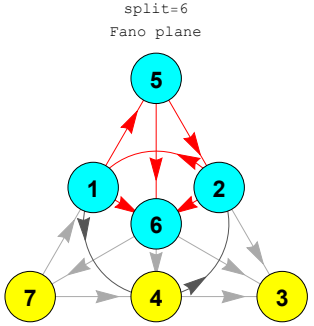
split=4

Fano plane



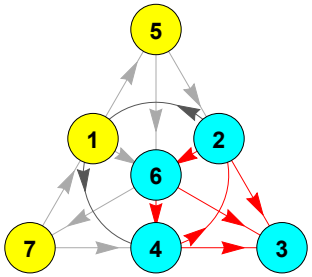
split=6

Fano plane



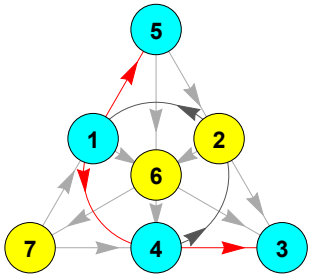
split=3

Fano plane



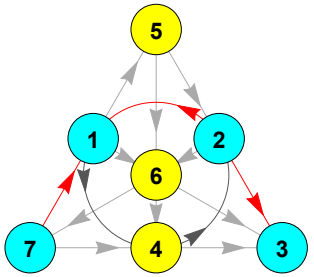
split=5

Fano plane



split=7

Fano plane

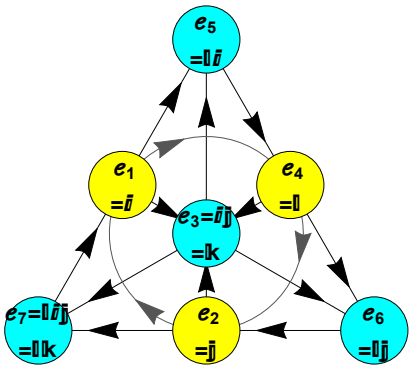


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
205	$\overline{e_5 \phi}^{\,0}_{b_d}$		0apggsscc	Bn{	0	1	1	0	1	1	1	0	}	Nd
			011000011_2	E8{	0	1	1	0	0	0	0	0	}	60

flip=False

{1, 4, 2}{1, 3, 6}{1, 5, 7}{2, 3, 5}{2, 7, 6}{3, 7, 4}{4, 6, 5}

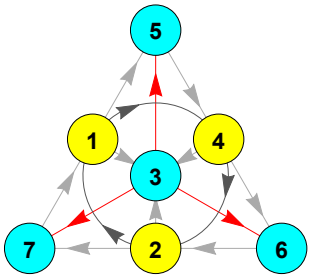
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	e_6	e_2	e_7	$-e_3$	$-e_5$
e_2	e_4	−1	e_5	$-e_1$	$-e_3$	$-e_7$	e_6
e_3	$-e_6$	$-e_5$	−1	$-e_7$	e_2	e_1	e_4
e_4	$-e_2$	e_1	e_7	−1	$-e_6$	e_5	$-e_3$
e_5	$-e_7$	e_3	$-e_2$	e_6	−1	$-e_4$	e_1
e_6	e_3	e_7	$-e_1$	$-e_5$	e_4	−1	$-e_2$
e_7	e_5	$-e_6$	$-e_4$	e_3	$-e_1$	e_2	−1

split=1

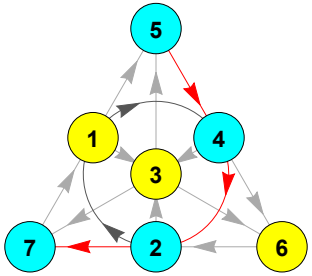
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	6	2	7	−3	−5
2	4	−1	5	−1	−3	−7	6
3	−6	−5	1	−7	−2	−1	−4
4	−2	1	7	−1	−6	5	−3
5	−7	3	2	6	1	4	−1
6	3	7	1	−5	−4	1	2
7	5	−6	4	3	1	−2	1

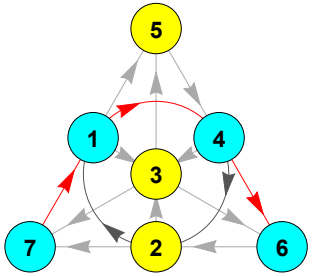
split=2

Fano plane



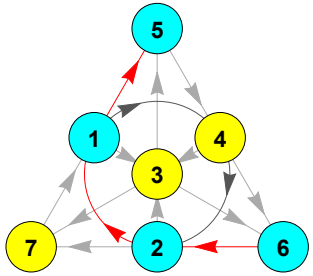
split=4

Fano plane



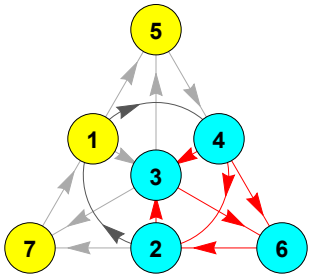
split=6

Fano plane



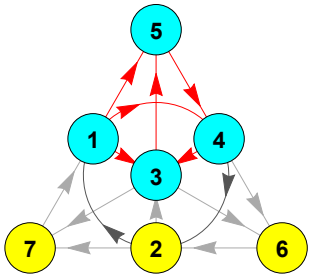
split=3

Fano plane



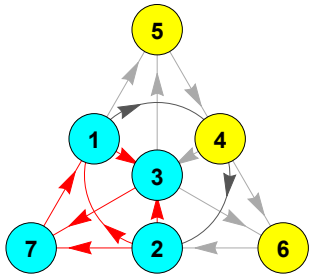
split=5

Fano plane



split=7

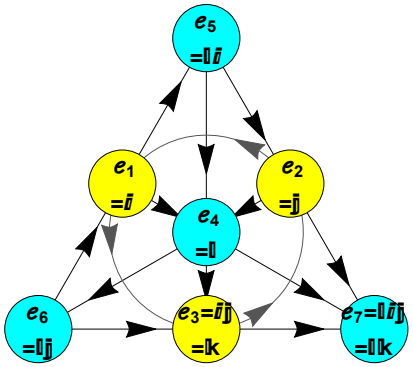
Fano plane



flip=True

{1, 3, 2}{1, 4, 7}{1, 5, 6}{2, 4, 6}{2, 7, 5}{3, 5, 4}{3, 7, 6}

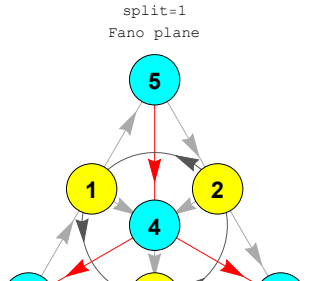
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	e_7	e_6	$-e_5$	$-e_4$
e_2	e_3	−1	$-e_1$	e_6	$-e_7$	$-e_4$	e_5
e_3	$-e_2$	e_1	−1	$-e_5$	e_4	$-e_7$	e_6
e_4	$-e_7$	$-e_6$	e_5	−1	$-e_3$	e_2	e_1
e_5	$-e_6$	e_7	$-e_4$	e_3	−1	e_1	$-e_2$
e_6	e_5	e_4	e_7	$-e_2$	$-e_1$	−1	$-e_3$
e_7	e_4	$-e_5$	$-e_6$	$-e_1$	e_2	e_3	−1

split=1

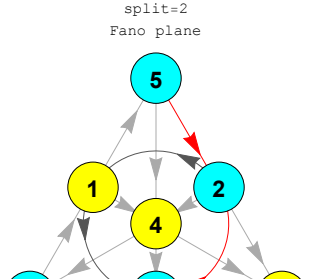
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	7	6	−5	−4
2	3	−1	−1	6	−7	−4	5
3	−2	1	−1	−5	4	−7	6
4	−7	−6	5	1	3	−2	−1
5	−6	7	−4	−3	1	−1	2
6	5	4	7	2	1	1	3
7	4	−5	−6	1	−2	−3	1

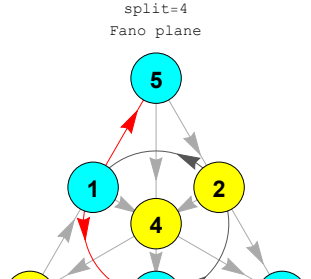
split=2

Fano plane



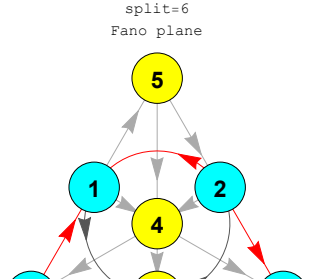
split=4

Fano plane



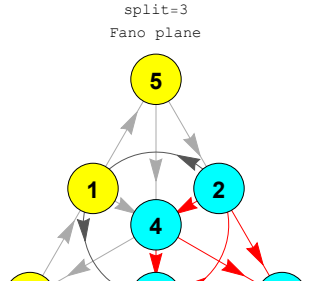
split=6

Fano plane



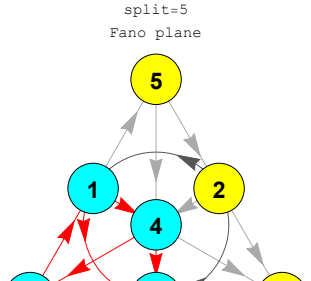
split=3

Fano plane



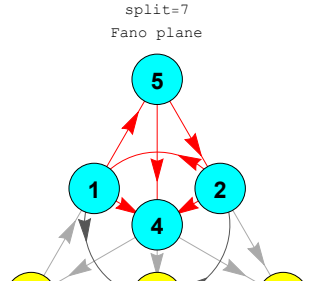
split=5

Fano plane



split=7

Fano plane

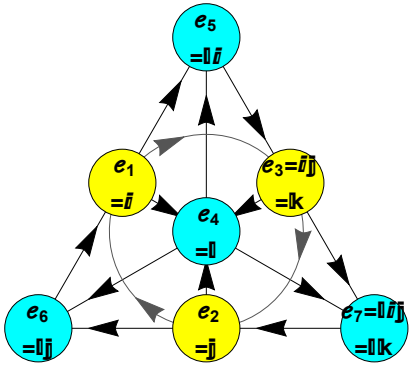


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
206			0apggsscc	Bn{ 0 1 1 0 1 1 0 1 }	O
			011001110₂	E8{ 1 -1 0 0 0 0 0 0 }	8

flip=False

{1, 3, 2}{1, 4, 7}{1, 5, 6}{2, 4, 5}{2, 6, 7}{3, 4, 6}{3, 7, 5}

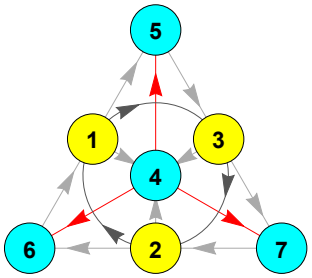
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	e_7	e_6	$-e_5$	$-e_4$
e_2	e_3	-1	$-e_1$	e_5	$-e_4$	e_7	$-e_6$
e_3	$-e_2$	e_1	-1	e_6	$-e_7$	$-e_4$	e_5
e_4	$-e_7$	$-e_5$	$-e_6$	-1	e_2	e_3	e_1
e_5	$-e_6$	e_4	e_7	$-e_2$	-1	e_1	$-e_3$
e_6	e_5	$-e_7$	e_4	$-e_3$	$-e_1$	-1	e_2
e_7	e_4	e_6	$-e_5$	$-e_1$	e_3	$-e_2$	-1

split=1

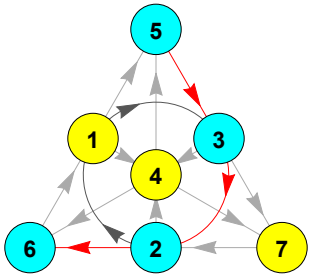
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	7	6	-5	-4
2	3	-1	-1	5	-4	7	-6
3	-2	1	-1	6	-7	-4	5
4	-7	-5	-6	1	-2	-3	-1
5	-6	4	7	2	1	-1	3
6	5	-7	4	3	1	1	-2
7	4	6	-5	1	-3	2	1

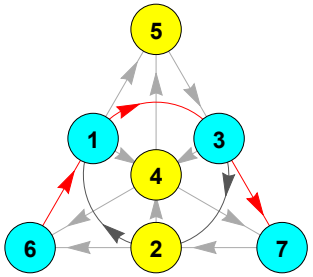
split=2

Fano plane



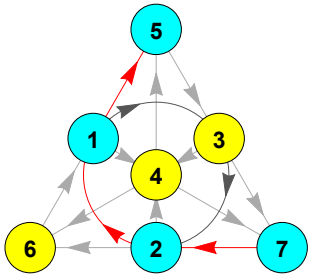
split=4

Fano plane



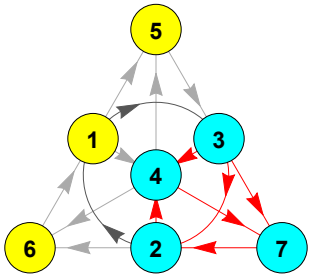
split=6

Fano plane



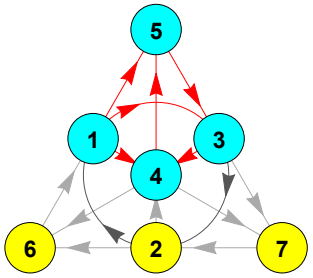
split=3

Fano plane



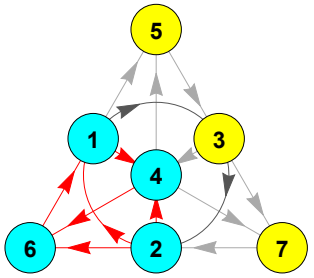
split=5

Fano plane



split=7

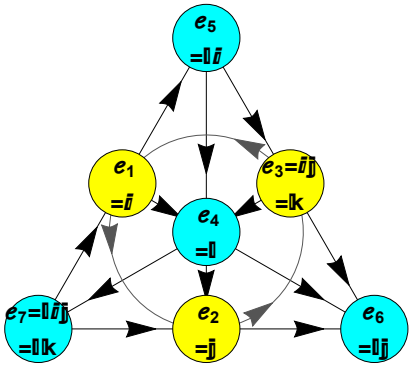
Fano plane



flip=True

{1, 2, 3}{1, 4, 6}{1, 5, 7}{2, 5, 4}{2, 6, 7}{3, 4, 7}{3, 6, 5}

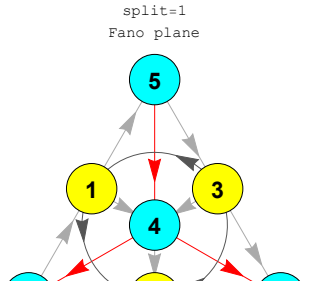
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_6	e_7	$-e_4$	$-e_5$
e_2	$-e_3$	-1	e_1	$-e_5$	e_4	e_7	$-e_6$
e_3	e_2	$-e_1$	-1	e_7	$-e_6$	e_5	$-e_4$
e_4	$-e_6$	e_5	$-e_7$	-1	$-e_2$	e_1	e_3
e_5	$-e_7$	$-e_4$	e_6	e_2	-1	$-e_3$	e_1
e_6	e_4	$-e_7$	$-e_5$	$-e_1$	e_3	-1	e_2
e_7	e_5	e_6	e_4	$-e_3$	$-e_1$	$-e_2$	-1

split=1

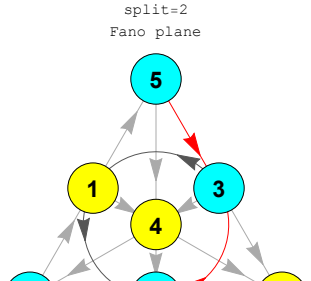
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	6	7	-4	-5
2	-3	-1	1	-5	4	7	-6
3	2	-1	-1	7	-6	5	-4
4	-6	5	-7	1	2	-1	-3
5	-7	-4	6	-2	1	3	-1
6	4	-7	-5	1	-3	1	-2
7	5	6	4	3	1	2	1

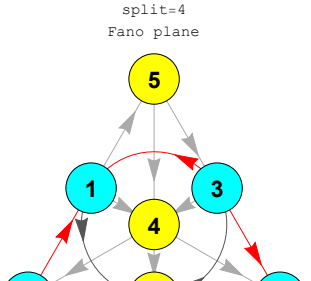
split=2

Fano plane



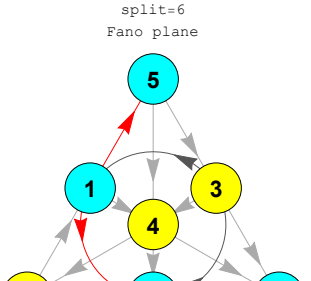
split=4

Fano plane



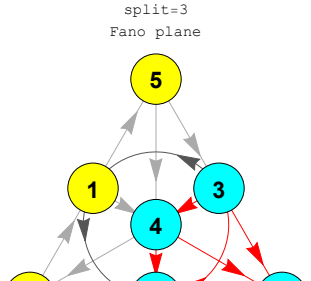
split=6

Fano plane



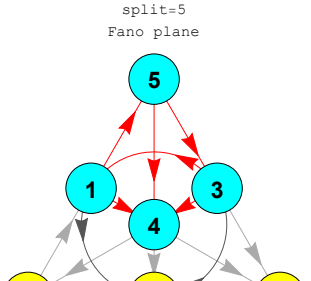
split=3

Fano plane



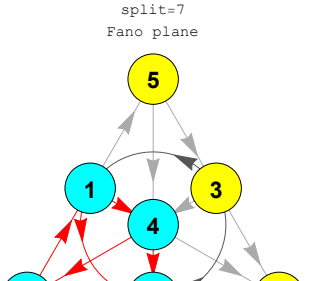
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Quantum Bits Coordinates #

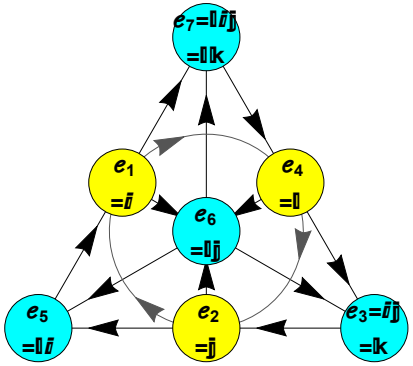
207 $\overline{e_7 \phi}^{\,0}_{b_1}$ 0apggsscc Bn{ 0 1 1 0 1 0 1 1 } P

011000111$_2$ E8{ 1 0 -1 0 0 0 0 0 } 15

flip=False

{1, 4, 2}{1, 6, 3}{1, 7, 5}{2, 5, 3}{2, 6, 7}{3, 7, 4}{4, 6, 5}

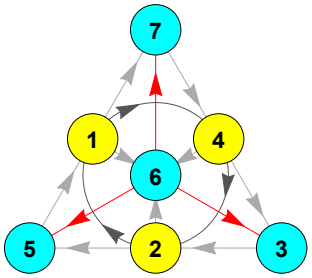
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	$-e_4$	$-e_6$	e_2	$-e_7$	e_3	e_5
e_2	e_4	$-e_4$	-1	$-e_5$	$-e_1$	e_3	e_7	$-e_6$
e_3	e_6	e_5	$-e_1$	-1	$-e_7$	$-e_2$	$-e_1$	e_4
e_4	$-e_2$	e_1	e_7	$-e_7$	-1	$-e_6$	e_5	$-e_3$
e_5	e_7	$-e_3$	e_2	e_6	$-e_6$	-1	$-e_4$	$-e_1$
e_6	$-e_3$	$-e_7$	e_1	$-e_5$	e_4	$-e_4$	-1	e_2
e_7	$-e_5$	e_6	$-e_4$	e_3	e_1	$-e_2$	$-e_1$	-1

split=1

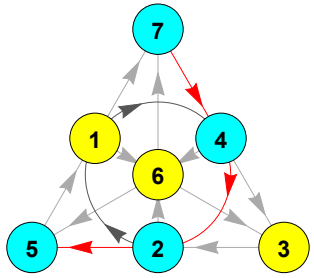
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	-6	2	-7	3	5
2	4	-1	-5	-1	3	7	-6
3	6	5	1	-7	2	1	-4
4	-2	1	7	-1	-6	5	-3
5	7	-3	-2	6	1	4	1
6	-3	-7	-1	-5	-4	1	-2
7	-5	6	4	3	-1	2	1

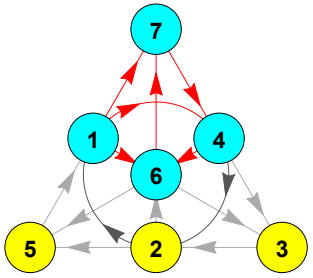
split=2

Fano plane



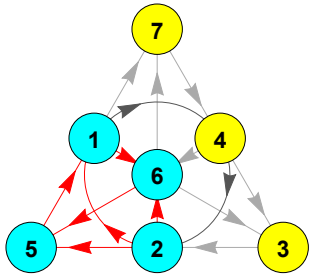
split=4

Fano plane



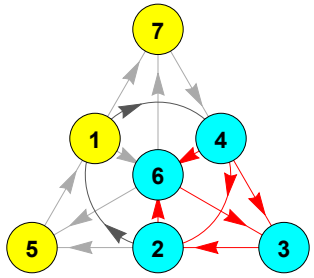
split=6

Fano plane



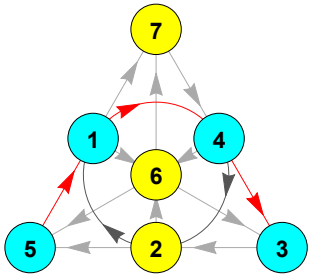
split=3

Fano plane



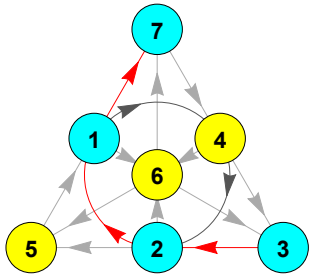
split=5

Fano plane



split=7

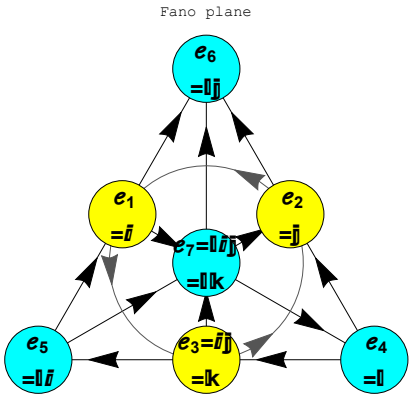
Fano plane



flip=True

{1, 3, 2}{1, 7, 4}{1, 6, 5}{2, 6, 4}{2, 5, 7}{3, 5, 4}{3, 7, 6}

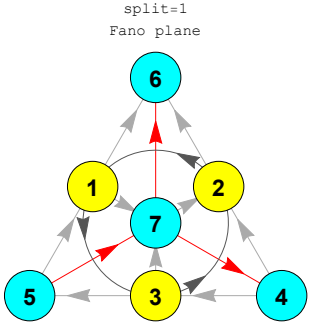
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	$-e_3$	e_2	$-e_7$	$-e_6$	e_5	e_4
e_2	e_3	-1	$-e_1$	$-e_6$	e_7	e_4	$-e_5$	
e_3	$-e_2$	e_1	-1	$-e_5$	e_4	$-e_7$	e_6	
e_4	e_7	e_6	e_5	-1	$-e_3$	$-e_2$	$-e_1$	
e_5	e_6	$-e_7$	$-e_4$	e_3	-1	$-e_1$	e_2	
e_6	$-e_5$	$-e_4$	e_7	e_2	e_1	-1	$-e_3$	
e_7	$-e_4$	e_5	$-e_6$	e_1	$-e_2$	e_3	-1	

split=1

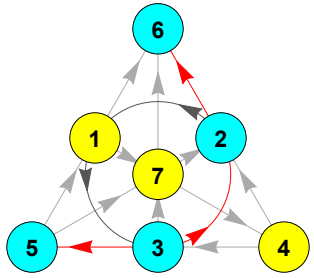
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-7	-6	5	4
2	3	-1	-1	-6	7	4	-5
3	-2	1	-1	-5	4	-7	6
4	7	6	5	1	3	2	1
5	6	-7	-4	-3	1	1	-2
6	-5	-4	7	-2	-1	1	3
7	-4	5	-6	-1	2	-3	1

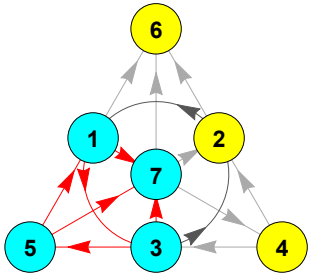
split=2

Fano plane



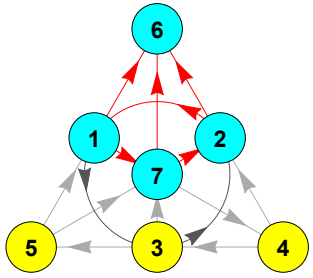
split=4

Fano plane



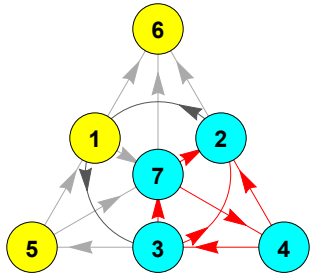
split=6

Fano plane



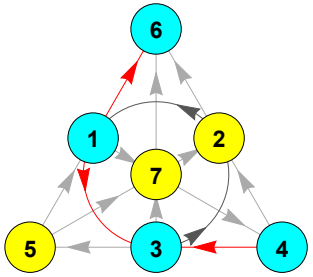
split=3

Fano plane



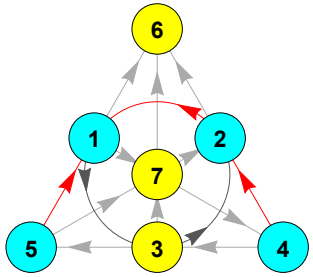
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

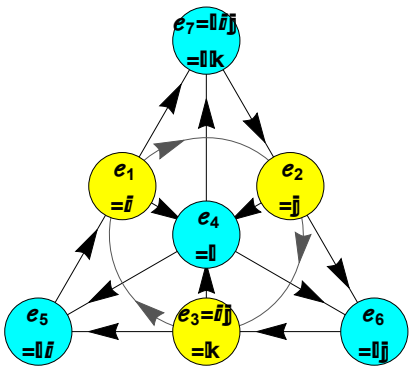
Quantum Bits Coordinates #

208 $e_{T\phi}$ $^{0\to1}_{L}$ $^{0\to1}_{q_d}$

0apggsscc Bn{ 0 1 1 0 0 1 1 1 } Ti
001000010_2 E8{ 1 0 0 -1 0 0 0 0 } 22

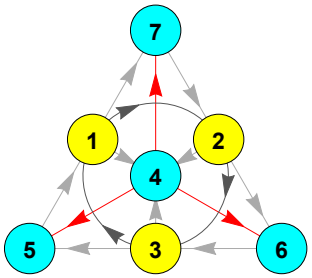
flip=False
{1, 2, 3}{1, 4, 6}{1, 7, 5}{2, 4, 5}{2, 6, 7}{3, 4, 7}{3, 5, 6}

Fano plane



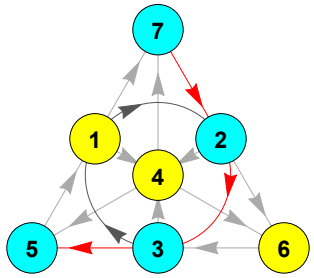
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_3	$-e_2$	e_6	$-e_7$	$-e_4$	e_5
e_2	$-e_3$	-1	e_1	e_5	$-e_4$	e_7	$-e_6$
e_3	e_2	$-e_1$	-1	e_7	e_6	$-e_5$	$-e_4$
e_4	$-e_6$	$-e_5$	$-e_7$	-1	e_2	e_1	e_3
e_5	e_7	e_4	$-e_6$	$-e_2$	-1	e_3	$-e_1$
e_6	e_4	$-e_7$	e_5	$-e_1$	$-e_3$	-1	e_2
e_7	$-e_5$	e_6	e_4	$-e_3$	e_1	$-e_2$	-1

split=1
Fano plane

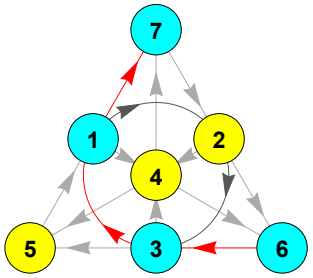


0↦1	1	2	3	4	5	6	7
1	-1	3	-2	6	-7	-4	5
2	-3	-1	1	5	-4	7	-6
3	2	-1	-1	7	6	-5	-4
4	-6	-5	-7	1	-2	-1	-3
5	7	4	-6	2	1	-3	1
6	4	-7	5	1	3	1	-2
7	-5	6	4	3	-1	2	1

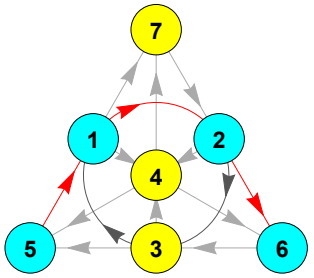
split=2
Fano plane



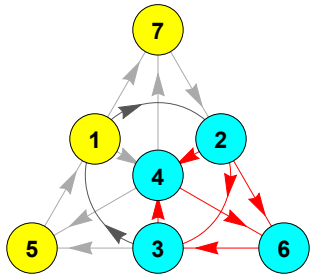
split=4
Fano plane



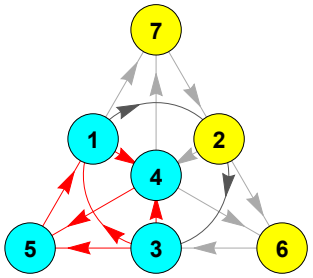
split=6
Fano plane



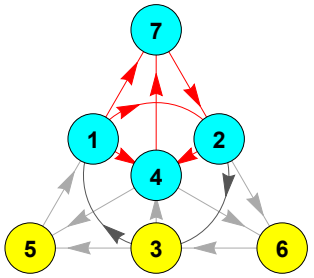
split=3
Fano plane



split=5
Fano plane

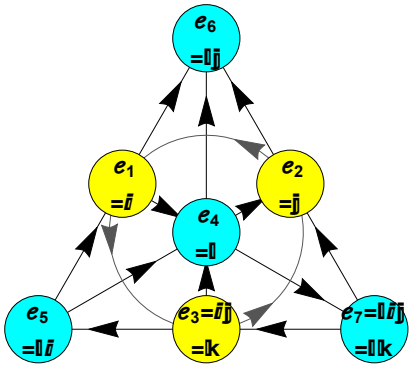


split=7
Fano plane



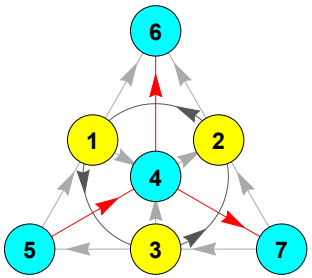
flip=True
{1, 3, 2}{1, 4, 7}{1, 6, 5}{2, 5, 4}{2, 6, 7}{3, 4, 6}{3, 5, 7}

Fano plane



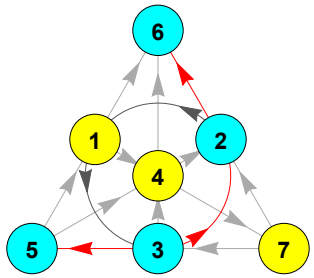
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	e_7	$-e_6$	e_5	$-e_4$
e_2	e_3	-1	$-e_1$	$-e_5$	e_4	e_7	$-e_6$
e_3	$-e_2$	e_1	-1	e_6	e_7	$-e_4$	$-e_5$
e_4	$-e_7$	e_5	$-e_6$	-1	$-e_2$	e_3	e_1
e_5	e_6	$-e_4$	$-e_7$	e_2	-1	$-e_1$	e_3
e_6	$-e_5$	$-e_7$	e_4	$-e_3$	e_1	-1	e_2
e_7	e_4	e_6	e_5	$-e_1$	$-e_3$	$-e_2$	-1

split=1
Fano plane

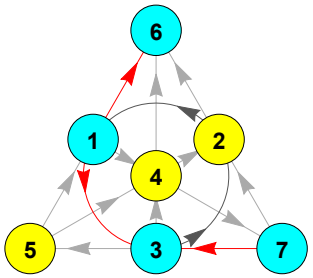


0↦1	1	2	3	4	5	6	7
1	-1	-3	2	7	-6	5	-4
2	3	-1	-1	-5	4	7	-6
3	-2	1	-1	6	7	-4	-5
4	-7	5	-6	1	2	-3	-1
5	6	-4	-7	-2	1	1	-3
6	-5	-7	4	3	-1	1	-2
7	4	6	5	1	3	2	1

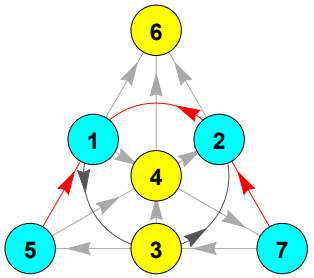
split=2
Fano plane



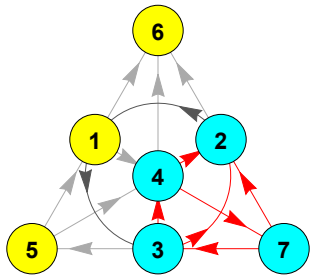
split=4
Fano plane



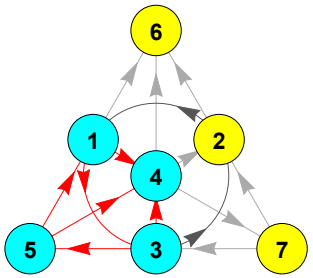
split=6
Fano plane



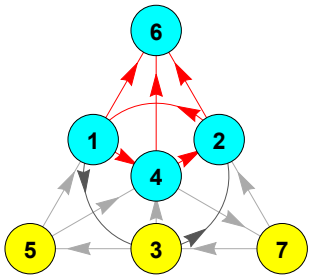
split=3
Fano plane



split=5
Fano plane



split=7
Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

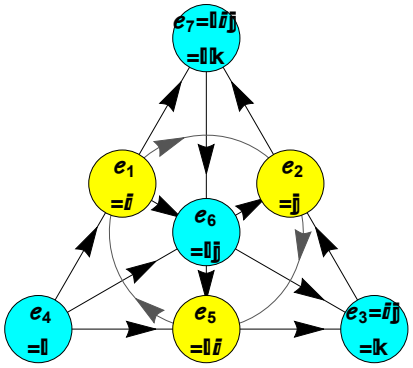
Quantum Bits Coordinates #

209 $\frac{\mu}{\gamma_m}^{+\to 0}_{\hat{R}}$

0apggsscc Bn{ 0 1 0 1 1 1 1 0 } Cu
010101100_2 E8{ 1 0 0 0 -1 0 0 0 } 29

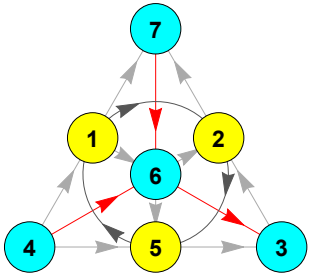
flip=False
{1, 2, 5}{1, 6, 3}{1, 7, 4}{2, 7, 3}{2, 4, 6}{3, 4, 5}{5, 7, 6}

Fano plane



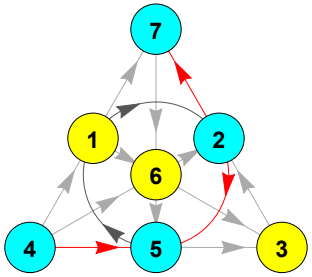
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	$-e_6$	$-e_7$	$-e_2$	e_3	e_4
e_2	$-e_5$	-1	$-e_7$	e_6	e_1	$-e_4$	e_3
e_3	e_6	e_7	-1	e_5	$-e_4$	$-e_1$	$-e_2$
e_4	e_7	$-e_6$	$-e_5$	-1	e_3	e_2	$-e_1$
e_5	e_2	$-e_1$	e_4	$-e_3$	-1	$-e_7$	e_6
e_6	$-e_3$	e_4	e_1	$-e_2$	e_7	-1	$-e_5$
e_7	$-e_4$	$-e_3$	e_2	e_1	$-e_6$	e_5	-1

split=1
Fano plane

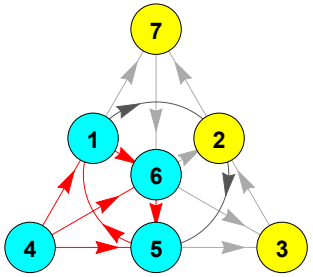


0↦1	1	2	3	4	5	6	7
1	-1	5	-6	-7	-2	3	4
2	-5	-1	-7	6	1	-4	3
3	6	7	1	-5	-4	1	2
4	7	-6	5	1	3	-2	1
5	2	-1	4	-3	-1	-7	6
6	-3	4	-1	2	7	1	5
7	-4	-3	-2	-1	-6	-5	1

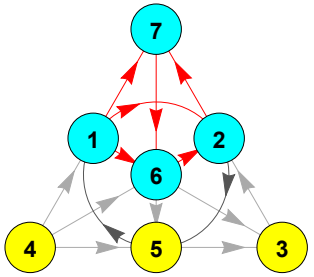
split=2
Fano plane



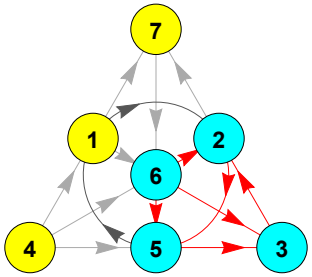
split=4
Fano plane



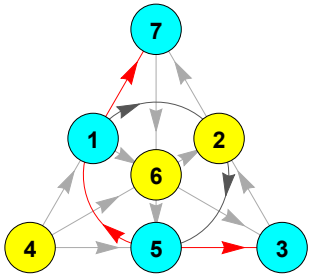
split=6
Fano plane



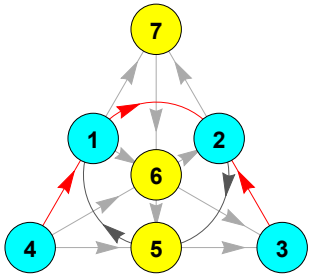
split=3
Fano plane



split=5
Fano plane

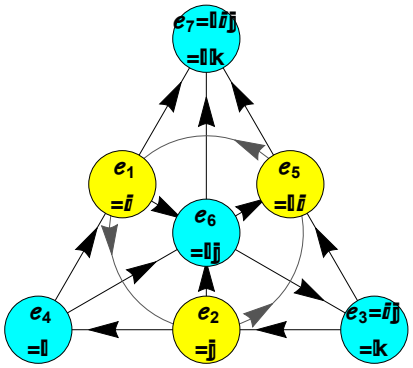


split=7
Fano plane



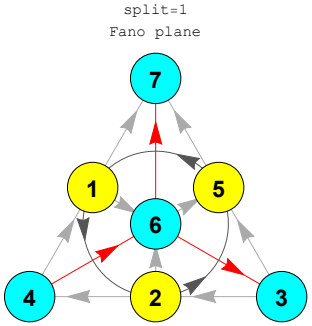
flip=True
{1, 2, 5}{1, 6, 3}{1, 7, 4}{2, 4, 3}{2, 6, 7}{3, 5, 7}{4, 6, 5}

Fano plane



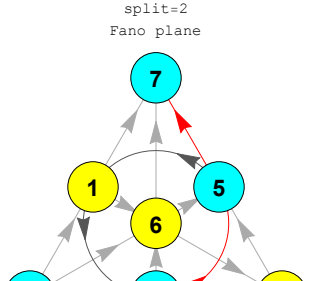
	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_5	$-e_6$	$-e_7$	$-e_2$	e_3	e_4
e_2	$-e_5$	-1	$-e_4$	e_3	e_1	e_7	$-e_6$
e_3	e_6	e_4	-1	$-e_2$	e_7	$-e_1$	$-e_5$
e_4	e_7	$-e_3$	e_2	-1	$-e_6$	e_5	$-e_1$
e_5	e_2	$-e_1$	$-e_7$	e_6	-1	$-e_4$	e_3
e_6	$-e_3$	$-e_7$	e_1	$-e_5$	e_4	-1	e_2
e_7	$-e_4$	e_6	e_5	e_1	$-e_3$	$-e_2$	-1

split=1
Fano plane

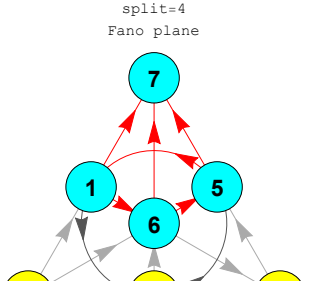


0↦1	1	2	3	4	5	6	7
1	-1	5	-6	-7	-2	3	4
2	-5	-1	-4	3	1	7	-6
3	6	4	1	2	7	1	5
4	7	-3	-2	1	-6	-5	1
5	2	-1	-7	6	-1	-4	3
6	-3	-7	-1	5	4	1	-2
7	-4	6	-5	-1	-3	2	1

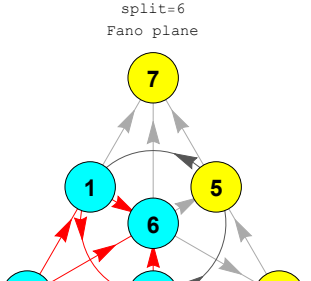
split=2
Fano plane



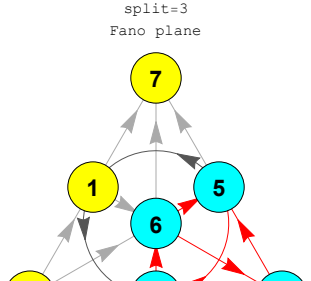
split=4
Fano plane



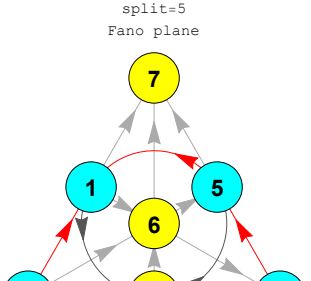
split=6
Fano plane



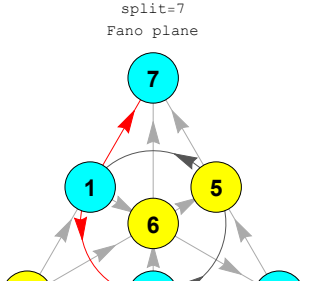
split=3
Fano plane



split=5
Fano plane



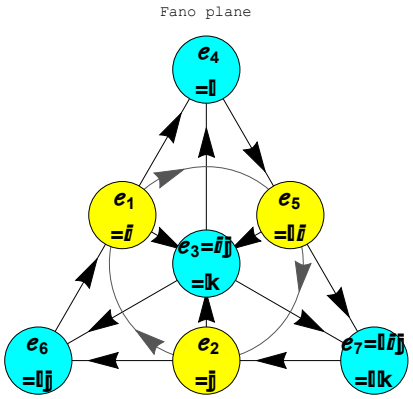
split=7
Fano plane



Seq #	Symbol	2D/3D Shape	Particle	Binary / E8	Ele
	Quantum Bits			Coordinates	#
210	$c_{r_m}^{0\to -1/3}$		0apggsscc	Bn{ 0 1 0 1 1 1 0 1 }	Kr
			0011010010_2	E8{ 1 0 0 0 0 -1 0 0 }	36

flip=False

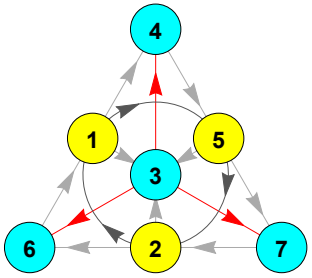
{1, 5, 2}{1, 3, 7}{1, 4, 6}{2, 3, 4}{2, 6, 7}{3, 6, 5}{4, 5, 7}



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_5$	e_7	e_6	e_2	$-e_4$	$-e_3$
e_2	e_2	e_5	−1	e_4	$-e_3$	$-e_1$	e_7	$-e_6$
e_3	e_3	$-e_7$	$-e_4$	−1	e_2	$-e_6$	e_5	e_1
e_4	e_4	$-e_6$	e_3	$-e_2$	−1	e_7	e_1	$-e_5$
e_5	e_5	$-e_2$	e_1	e_6	$-e_7$	−1	$-e_3$	e_4
e_6	e_6	e_4	$-e_7$	$-e_5$	$-e_1$	e_3	−1	e_2
e_7	e_7	e_3	e_6	$-e_1$	e_5	$-e_4$	$-e_2$	−1

split=1

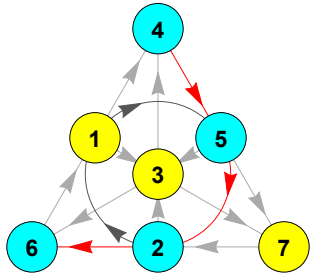
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	7	6	2	−4	−3
2	5	−1	4	−3	−1	7	−6
3	−7	−4	1	−2	−6	−5	−1
4	−6	3	2	1	7	−1	5
5	−2	1	6	−7	−1	−3	4
6	4	−7	5	1	3	1	−2
7	3	6	1	−5	−4	2	1

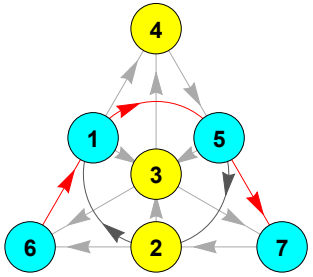
split=2

Fano plane



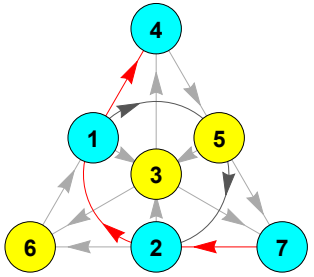
split=4

Fano plane



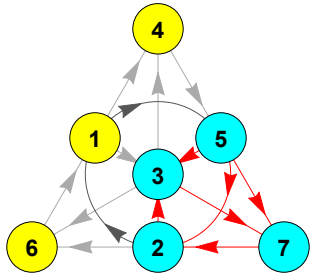
split=6

Fano plane



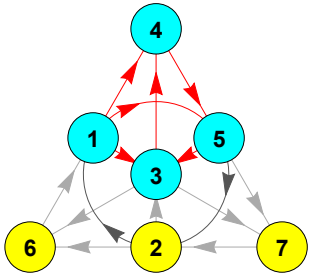
split=3

Fano plane



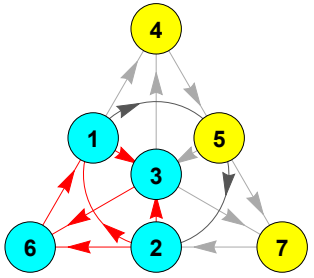
split=5

Fano plane



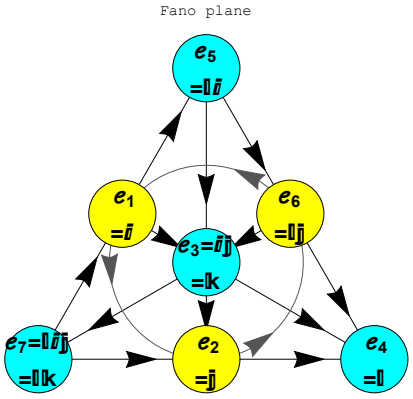
split=7

Fano plane



flip=True

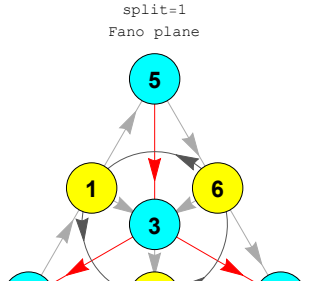
{1, 2, 6}{1, 3, 4}{1, 5, 7}{2, 5, 3}{2, 4, 7}{3, 7, 6}{4, 5, 6}



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_4	$-e_3$	e_7	$-e_2$	$-e_5$
e_2	e_2	$-e_6$	−1	$-e_5$	e_7	e_3	e_1	$-e_4$
e_3	e_3	$-e_4$	e_5	−1	e_1	$-e_2$	$-e_7$	e_6
e_4	e_4	e_3	$-e_7$	$-e_1$	−1	e_6	$-e_5$	e_2
e_5	e_5	$-e_7$	$-e_3$	e_2	$-e_6$	−1	e_4	e_1
e_6	e_6	e_2	$-e_1$	e_7	e_5	$-e_4$	−1	$-e_3$
e_7	e_7	e_5	e_4	$-e_6$	$-e_2$	$-e_1$	e_3	−1

split=1

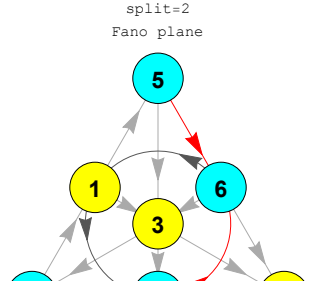
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	4	−3	7	−2	−5
2	−6	−1	−5	7	3	1	−4
3	−4	5	1	−1	2	−7	−6
4	3	−7	1	1	−6	−5	−2
5	−7	−3	−2	6	1	4	−1
6	2	−1	7	5	−4	−1	−3
7	5	4	6	2	1	3	1

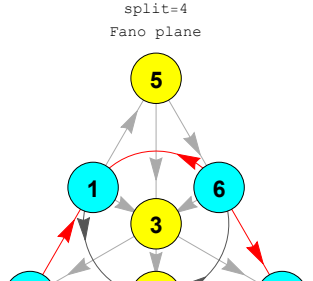
split=2

Fano plane



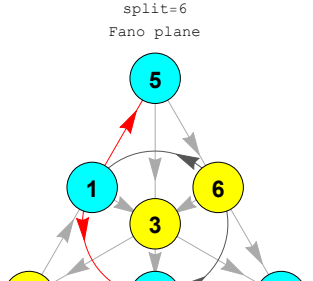
split=4

Fano plane



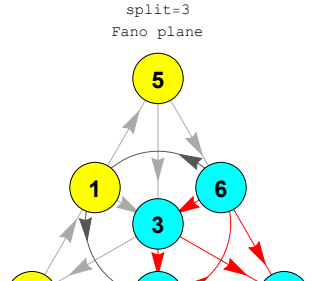
split=6

Fano plane



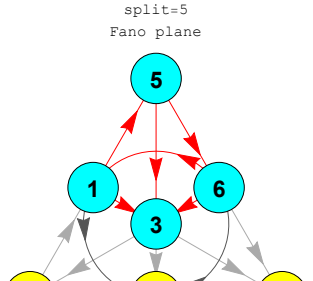
split=3

Fano plane



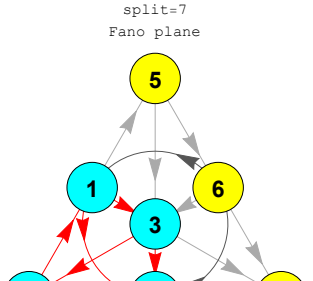
split=5

Fano plane



split=7

Fano plane



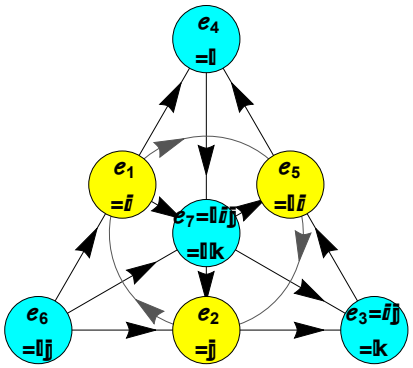
Seq #	Symbol	2D/3D Shape	Particle	Binary / E8	Ele

Seq #	Symbol	2D/3D Shape	Particle	Binary / E8	Ele
			Quantum Bits	Coordinates	#
211	$\overset{0\to-1/3}{\underset{g_m}{C}}{}^{}_{L}$		0apggsscc 0011010102	Bn{ 0 1 0 1 1 0 1 1 } E8{ 1 0 0 0 0 0 -1 0 }	Mo 42

flip=False

{1, 5, 2}{1, 7, 3}{1, 4, 6}{2, 3, 6}{2, 4, 7}{3, 5, 4}{5, 6, 7}

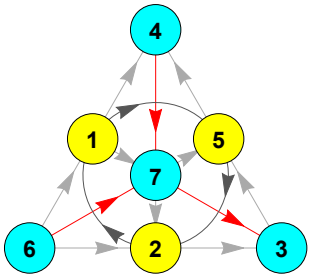
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_5$	$-e_7$	e_6	e_2	$-e_4$	e_3
e_2	e_5	-1	e_6	e_7	$-e_1$	$-e_3$	$-e_4$
e_3	e_7	$-e_6$	-1	$-e_5$	e_4	e_2	$-e_1$
e_4	$-e_6$	$-e_7$	e_5	-1	$-e_3$	e_1	e_2
e_5	$-e_2$	e_1	$-e_4$	e_3	-1	e_7	$-e_6$
e_6	e_4	e_3	$-e_2$	$-e_1$	$-e_7$	-1	e_5
e_7	$-e_3$	e_4	e_1	$-e_2$	e_6	$-e_5$	-1

split=1

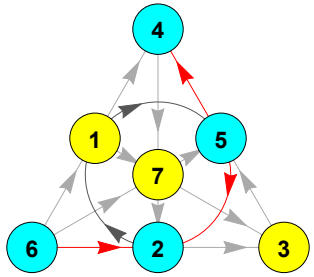
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-5	-7	6	2	-4	3
2	5	-1	6	7	-1	-3	-4
3	7	-6	1	5	4	-2	1
4	-6	-7	-5	1	-3	-1	-2
5	-2	1	-4	3	-1	7	-6
6	4	3	2	1	-7	1	-5
7	-3	4	-1	2	6	5	1

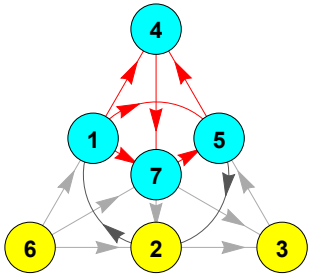
split=2

Fano plane



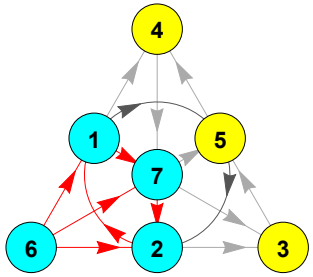
split=4

Fano plane



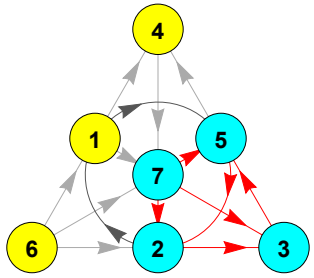
split=6

Fano plane



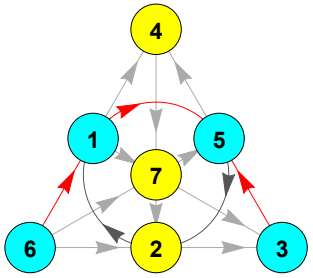
split=3

Fano plane



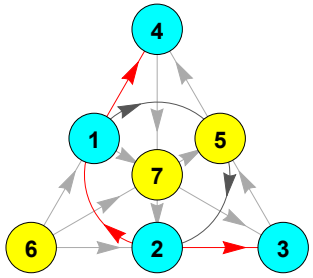
split=5

Fano plane



split=7

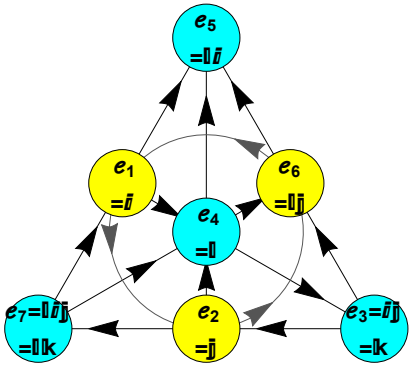
Fano plane



flip=True

{1, 2, 6}{1, 4, 3}{1, 5, 7}{2, 7, 3}{2, 4, 5}{3, 6, 5}{4, 6, 7}

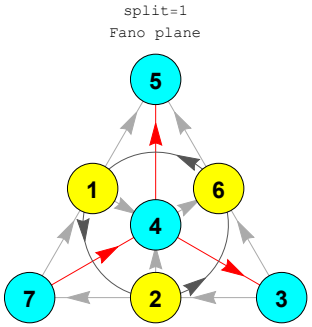
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_4$	e_3	e_7	$-e_2$	$-e_5$
e_2	$-e_6$	-1	$-e_7$	e_5	$-e_4$	e_1	e_3
e_3	e_4	e_7	-1	$-e_1$	$-e_6$	e_5	$-e_2$
e_4	$-e_3$	$-e_5$	e_1	-1	e_2	e_7	$-e_6$
e_5	$-e_7$	e_4	e_6	$-e_2$	-1	$-e_3$	e_1
e_6	e_2	$-e_1$	$-e_5$	$-e_7$	e_3	-1	e_4
e_7	e_5	$-e_3$	e_2	e_6	$-e_1$	$-e_4$	-1

split=1

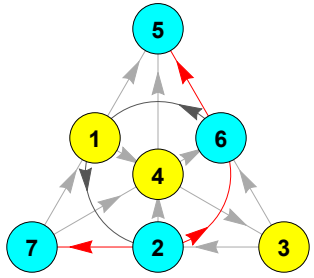
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	6	-4	3	7	-2	-5
2	-6	-1	-7	5	-4	1	3
3	4	7	1	1	6	5	2
4	-3	-5	-1	1	-2	7	6
5	-7	4	-6	2	1	-3	-1
6	2	-1	-5	-7	3	-1	4
7	5	-3	-2	-6	1	-4	1

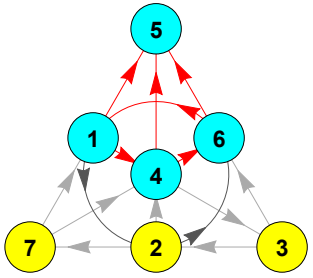
split=2

Fano plane



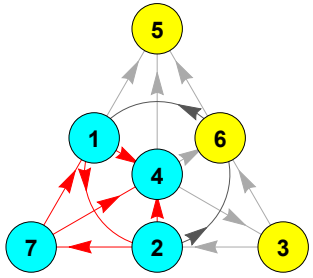
split=4

Fano plane



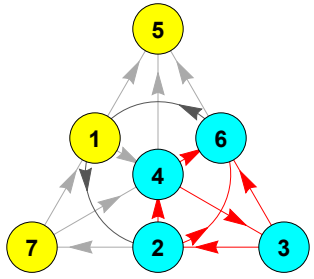
split=6

Fano plane



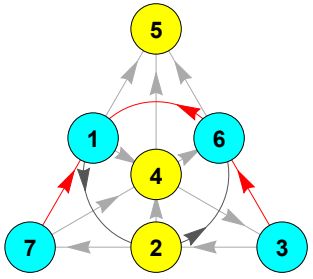
split=3

Fano plane



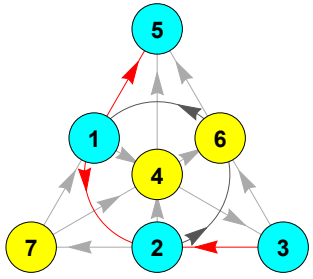
split=5

Fano plane



split=7

Fano plane



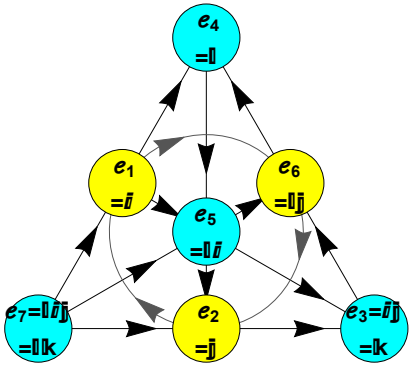
Seq #	Symbol	2D/3D Shape	Particle	Binary / E8	Ele

Seq #	Symbol	2D/3D Shape	Particle	Binary / E8	Ele
		Quantum Bits	Coordinates		#
212	$\mathrm{C}_{\mathrm{bm}}^{2/3\to-1/3}$		0apggsscc 001101011_2	Bn{ 0 1 0 1 0 1 1 1 } E8{ 1 0 0 0 0 0 0 -1 }	Ubn 120

flip=False

{1, 6, 2}{1, 5, 3}{1, 4, 7}{2, 3, 7}{2, 4, 5}{3, 6, 4}{5, 6, 7}

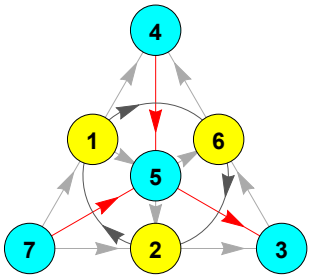
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	$-e_5$	e_7	e_3	e_2	$-e_4$
e_2	e_2	e_6	−1	e_7	e_5	$-e_4$	$-e_1$	$-e_3$
e_3	e_3	e_5	$-e_7$	−1	$-e_6$	$-e_1$	e_4	e_2
e_4	e_4	$-e_7$	$-e_5$	e_6	−1	e_2	$-e_3$	e_1
e_5	e_5	$-e_3$	e_4	e_1	$-e_2$	−1	e_7	$-e_6$
e_6	e_6	$-e_2$	e_1	$-e_4$	e_3	$-e_7$	−1	e_5
e_7	e_7	e_4	e_3	$-e_2$	$-e_1$	e_6	$-e_5$	−1

split=1

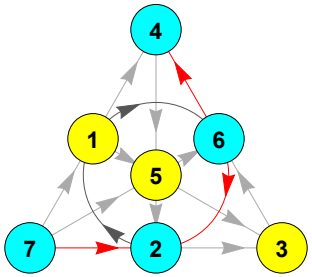
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−5	7	3	2	−4
2	6	−1	7	5	−4	−1	−3
3	5	−7	1	6	1	4	−2
4	−7	−5	−6	1	−2	−3	−1
5	−3	4	−1	2	1	7	6
6	−2	1	−4	3	−7	−1	5
7	4	3	2	1	−6	−5	1

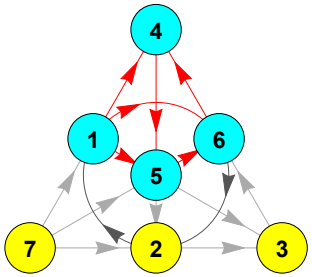
split=2

Fano plane



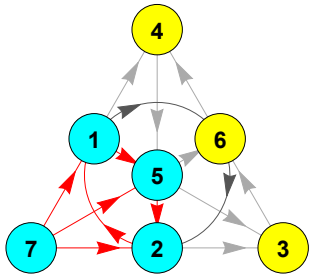
split=4

Fano plane



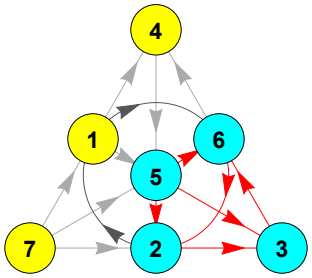
split=6

Fano plane



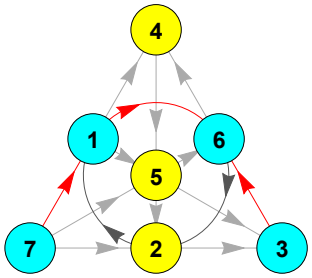
split=3

Fano plane



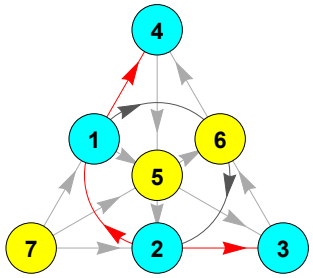
split=5

Fano plane



split=7

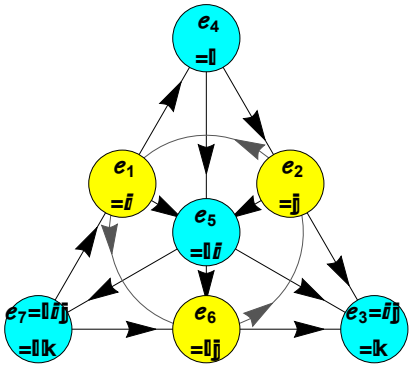
Fano plane



flip=True

{1, 6, 2}{1, 5, 3}{1, 4, 7}{2, 3, 4}{2, 5, 7}{3, 7, 6}{4, 5, 6}

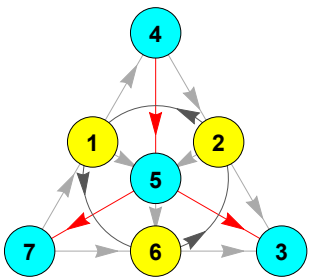
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	$-e_5$	e_7	e_3	e_2	$-e_4$
e_2	e_2	e_6	−1	e_4	$-e_3$	e_7	$-e_1$	$-e_5$
e_3	e_3	e_5	$-e_4$	−1	e_2	$-e_1$	$-e_7$	e_6
e_4	e_4	$-e_7$	e_3	$-e_2$	−1	e_6	$-e_5$	e_1
e_5	e_5	$-e_3$	$-e_7$	e_1	$-e_6$	−1	e_4	e_2
e_6	e_6	$-e_2$	e_1	e_7	e_5	$-e_4$	−1	$-e_3$
e_7	e_7	e_4	e_5	$-e_6$	$-e_1$	$-e_2$	e_3	−1

split=1

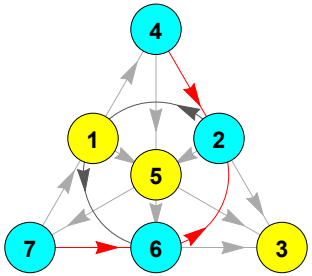
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−5	7	3	2	−4
2	6	−1	4	−3	7	−1	−5
3	5	−4	1	−2	1	−7	−6
4	−7	3	2	1	−6	−5	−1
5	−3	−7	−1	6	1	4	−2
6	−2	1	7	5	−4	−1	−3
7	4	5	6	1	2	3	1

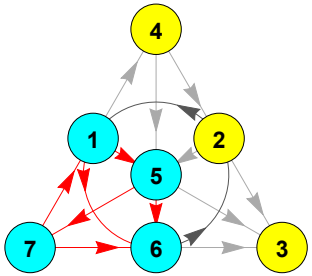
split=2

Fano plane



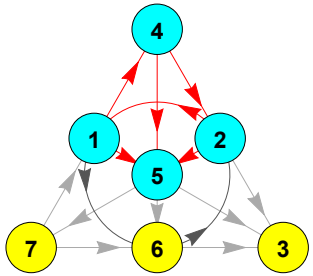
split=4

Fano plane



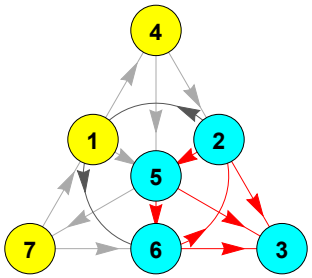
split=6

Fano plane



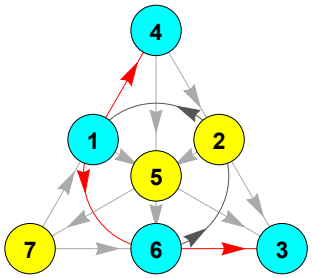
split=3

Fano plane



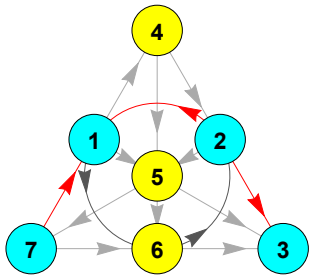
split=5

Fano plane

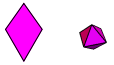


split=7

Fano plane



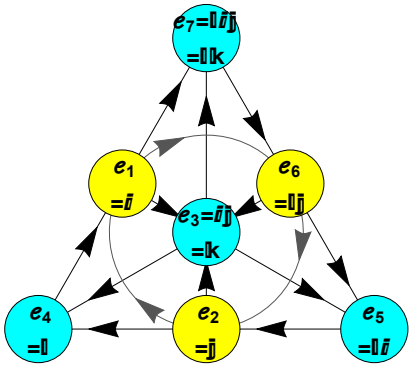
Seq #	Symbol	2D/3D Shape	Particle	Binary / E8	Ele

Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
213	$\frac{\bar{o}}{m}^{1/3}_{\bar{R}}$		0apggsscc 010101111_2	Bn{ 0 1 0 0 1 1 1 1 } E8{ 1 0 0 0 0 0 0 1 }	$\overline{Bk}$ 97

flip=False

{1, 6, 2}{1, 3, 5}{1, 7, 4}{2, 3, 7}{2, 4, 5}{3, 4, 6}{5, 7, 6}

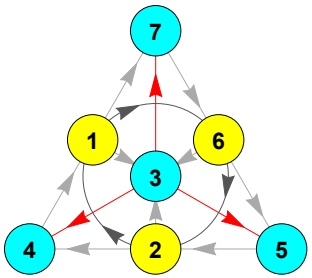
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	e_5	$-e_7$	$-e_3$	e_2	e_4
e_2	e_2	e_6	−1	e_7	e_5	$-e_4$	$-e_1$	$-e_3$
e_3	e_3	$-e_5$	$-e_7$	−1	e_6	e_1	$-e_4$	e_2
e_4	e_4	e_7	$-e_5$	$-e_6$	−1	e_2	e_3	$-e_1$
e_5	e_5	e_3	e_4	$-e_1$	$-e_2$	−1	$-e_7$	e_6
e_6	e_6	$-e_2$	e_1	e_4	$-e_3$	e_7	−1	$-e_5$
e_7	e_7	$-e_4$	e_3	$-e_2$	e_1	$-e_6$	e_5	−1

split=1

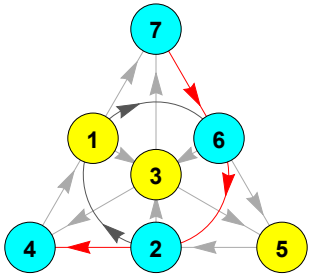
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	5	−7	−3	2	4
2	6	−1	7	5	−4	−1	−3
3	−5	−7	1	−6	−1	−4	−2
4	7	−5	6	1	−2	3	1
5	3	4	1	2	1	−7	−6
6	−2	1	4	−3	7	−1	−5
7	−4	3	2	−1	6	5	1

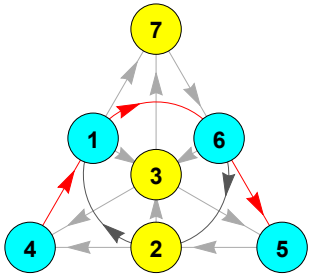
split=2

Fano plane



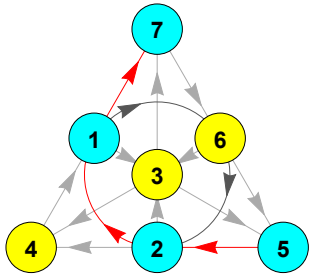
split=4

Fano plane



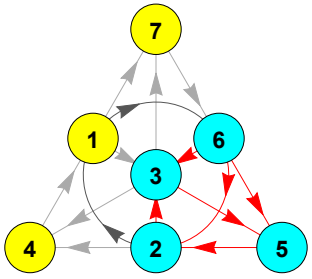
split=6

Fano plane



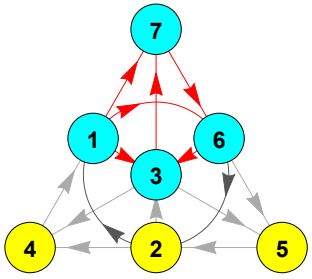
split=3

Fano plane



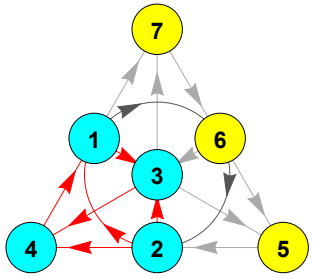
split=5

Fano plane



split=7

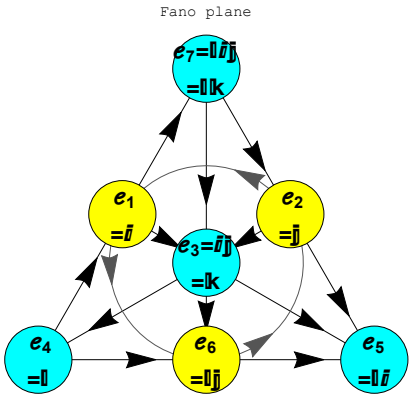
Fano plane



flip=True

{1, 6, 2}{1, 3, 5}{1, 7, 4}{2, 3, 4}{2, 5, 7}{3, 6, 7}{4, 6, 5}

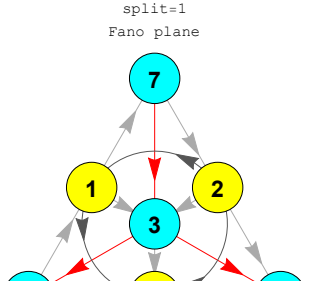
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_6$	e_5	$-e_7$	$-e_3$	e_2	e_4
e_2	e_2	e_6	−1	e_4	$-e_3$	e_7	$-e_1$	$-e_5$
e_3	e_3	$-e_5$	$-e_4$	−1	e_2	e_1	e_7	$-e_6$
e_4	e_4	e_7	e_3	$-e_2$	−1	$-e_6$	e_5	$-e_1$
e_5	e_5	e_3	$-e_7$	$-e_1$	e_6	−1	$-e_4$	e_2
e_6	e_6	$-e_2$	e_1	$-e_7$	$-e_5$	e_4	−1	e_3
e_7	e_7	$-e_4$	e_5	e_6	e_1	$-e_2$	$-e_3$	−1

split=1

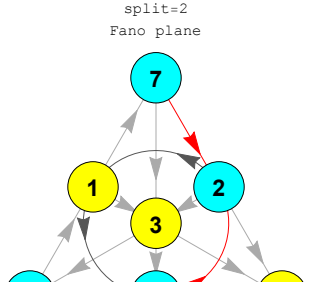
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	5	−7	−3	2	4
2	6	−1	4	−3	7	−1	−5
3	−5	−4	1	−2	−1	7	6
4	7	3	2	1	6	5	1
5	3	−7	1	−6	1	−4	−2
6	−2	1	−7	−5	4	−1	3
7	−4	5	−6	−1	2	−3	1

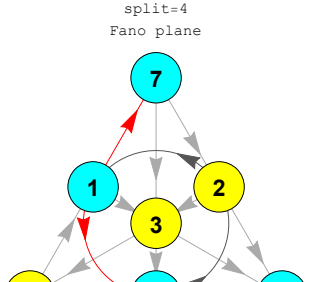
split=2

Fano plane



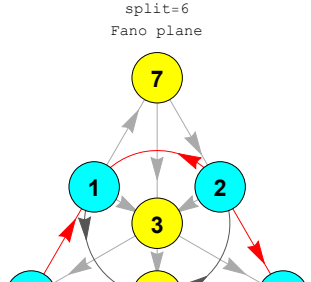
split=4

Fano plane



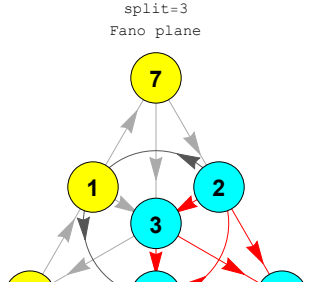
split=6

Fano plane



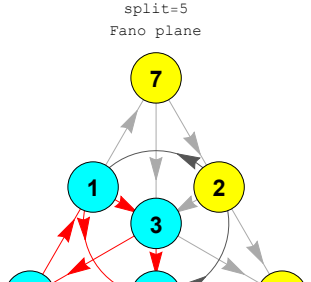
split=3

Fano plane



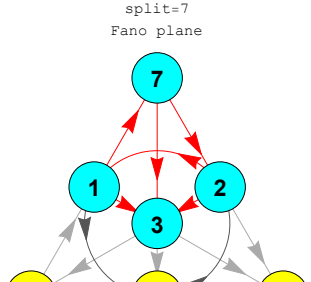
split=5

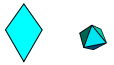
Fano plane



split=7

Fano plane

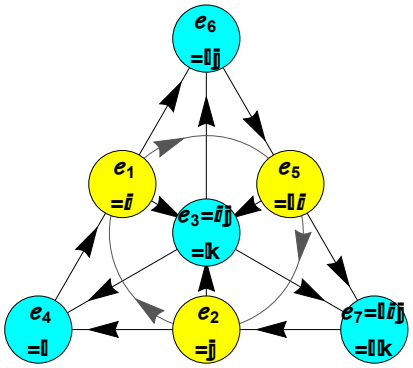


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates									Ele #
214	$\frac{S}{C_{3R}}^{\mapsto 1/3}$			0apggsscc 010101110_2	Bn{ E8{	0 1	0 0	1 0	1 0	1 0	1 0	1 1	0 0	} }	Tc 43

flip=False

{1, 5, 2}{1, 3, 7}{1, 6, 4}{2, 3, 6}{2, 4, 7}{3, 4, 5}{5, 7, 6}

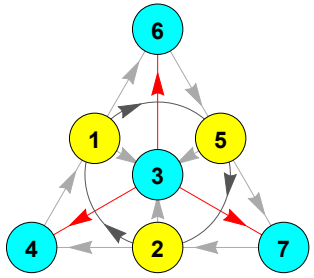
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_5$	e_7	$-e_6$	e_2	e_4	$-e_3$
e_2	e_2	e_5	−1	e_6	e_7	$-e_1$	$-e_3$	$-e_4$
e_3	e_3	$-e_7$	$-e_6$	−1	e_5	$-e_4$	e_2	e_1
e_4	e_4	e_6	$-e_7$	$-e_5$	−1	e_3	$-e_1$	e_2
e_5	e_5	$-e_2$	e_1	e_4	$-e_3$	−1	$-e_7$	e_6
e_6	e_6	$-e_4$	e_3	$-e_2$	e_1	e_7	−1	$-e_5$
e_7	e_7	e_3	e_4	$-e_1$	$-e_2$	$-e_6$	e_5	−1

split=1

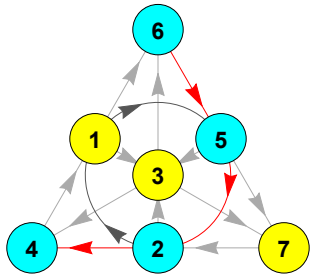
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	7	−6	2	4	−3
2	5	−1	6	7	−1	−3	−4
3	−7	−6	1	−5	−4	−2	−1
4	6	−7	5	1	3	1	−2
5	−2	1	4	−3	−1	−7	6
6	−4	3	2	−1	7	1	5
7	3	4	1	2	−6	−5	1

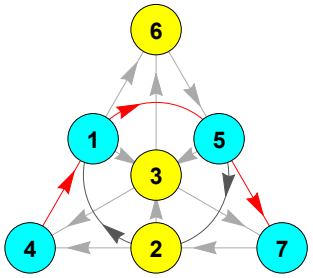
split=2

Fano plane



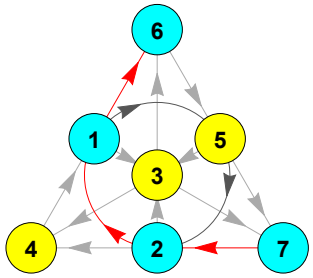
split=4

Fano plane



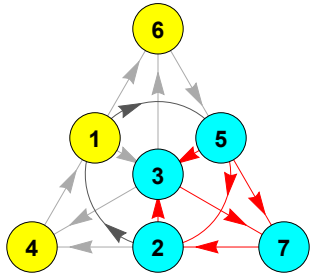
split=6

Fano plane



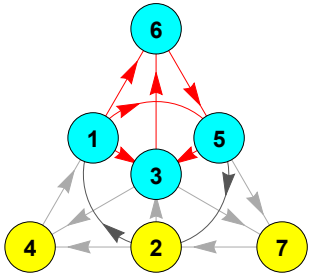
split=3

Fano plane



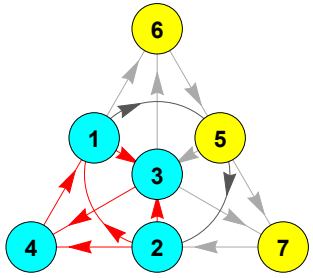
split=5

Fano plane



split=7

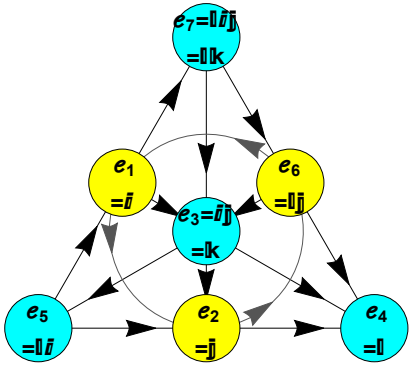
Fano plane



flip=True

{1, 2, 6}{1, 3, 4}{1, 7, 5}{2, 7, 3}{2, 4, 5}{3, 5, 6}{4, 7, 6}

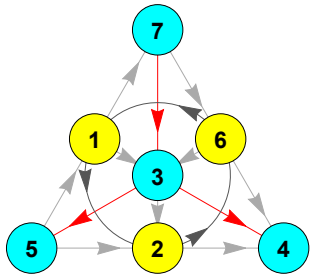
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_4	$-e_3$	$-e_7$	$-e_2$	e_5
e_2	e_2	$-e_6$	−1	$-e_7$	e_5	$-e_4$	e_1	e_3
e_3	e_3	$-e_4$	e_7	−1	e_1	e_6	$-e_5$	$-e_2$
e_4	e_4	e_3	$-e_5$	$-e_1$	−1	e_2	$-e_7$	e_6
e_5	e_5	e_7	e_4	$-e_6$	$-e_2$	−1	e_3	$-e_1$
e_6	e_6	e_2	$-e_1$	e_5	e_7	$-e_3$	−1	$-e_4$
e_7	e_7	$-e_5$	$-e_3$	e_2	$-e_6$	e_1	e_4	−1

split=1

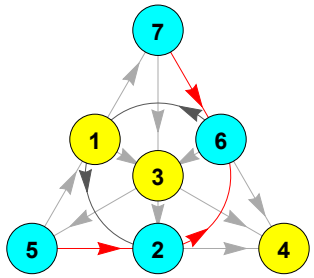
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	4	−3	−7	−2	5
2	−6	−1	−7	5	−4	1	3
3	−4	7	1	−1	−6	−5	2
4	3	−5	1	1	−2	−7	−6
5	7	4	6	2	1	3	1
6	2	−1	5	7	−3	−1	−4
7	−5	−3	−2	6	−1	4	1

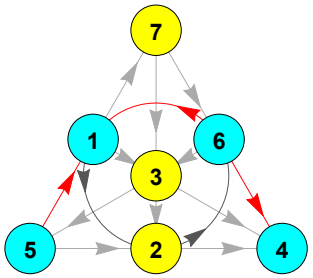
split=2

Fano plane



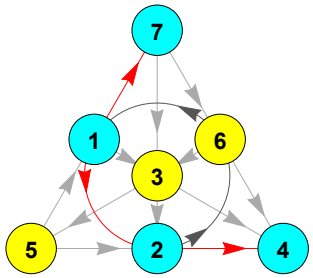
split=4

Fano plane



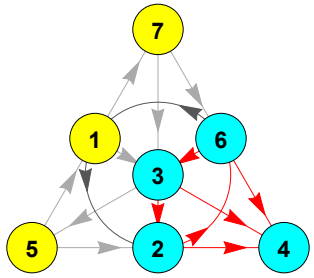
split=6

Fano plane



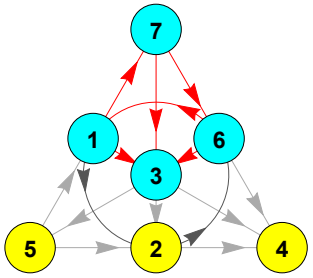
split=3

Fano plane



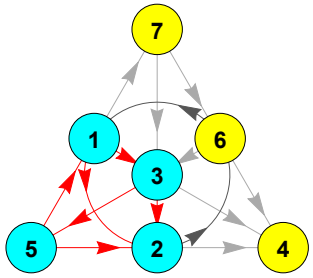
split=5

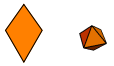
Fano plane



split=7

Fano plane

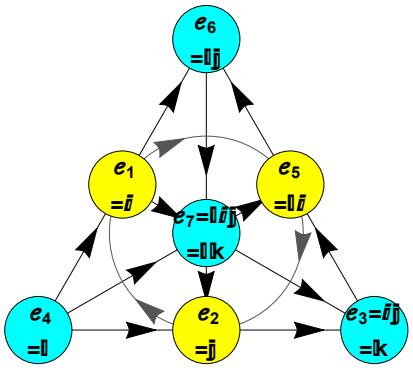


Seq #	Symbol	2D/3D Shape	Particle	Binary / E8	Ele
			Quantum Bits	Coordinates	#
215	$\frac{8}{3}^{\mapsto 1/3}$		0apggsscc	Bn{ 0 0 1 1 1 1 0 1 }	In
			010101101_2	E8{ 1 0 0 0 0 1 0 0 }	49

flip=False

{1, 5, 2}{1, 7, 3}{1, 6, 4}{2, 3, 4}{2, 6, 7}{3, 5, 6}{4, 7, 5}

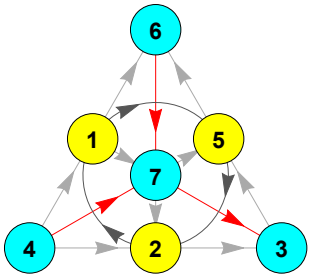
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_5$	$-e_7$	$-e_6$	e_2	e_4	e_3
e_2	e_5	−1	e_4	$-e_3$	$-e_1$	e_7	$-e_6$
e_3	e_7	$-e_4$	−1	e_2	e_6	$-e_5$	$-e_1$
e_4	e_6	e_3	$-e_2$	−1	$-e_7$	$-e_1$	e_5
e_5	$-e_2$	e_1	$-e_6$	e_7	−1	e_3	$-e_4$
e_6	$-e_4$	$-e_7$	e_5	e_1	$-e_3$	−1	e_2
e_7	$-e_3$	e_6	e_1	$-e_5$	e_4	$-e_2$	−1

split=1

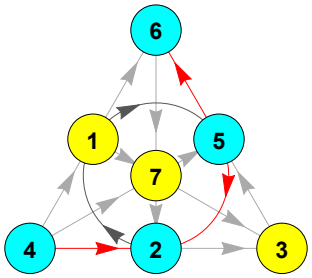
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−7	−6	2	4	3
2	5	−1	4	−3	−1	7	−6
3	7	−4	1	−2	6	5	1
4	6	3	2	1	−7	1	−5
5	−2	1	−6	7	−1	3	−4
6	−4	−7	−5	−1	−3	1	−2
7	−3	6	−1	5	4	2	1

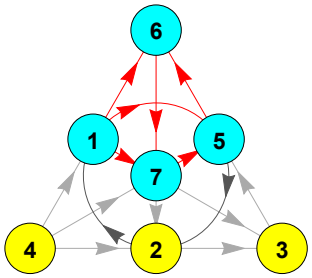
split=2

Fano plane



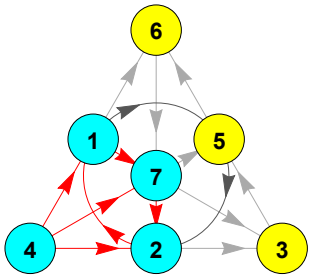
split=4

Fano plane



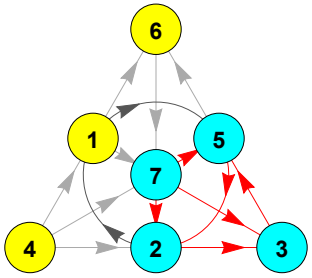
split=6

Fano plane



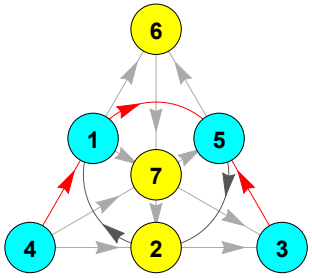
split=3

Fano plane



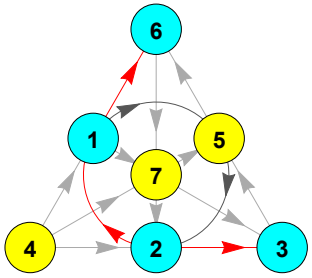
split=5

Fano plane



split=7

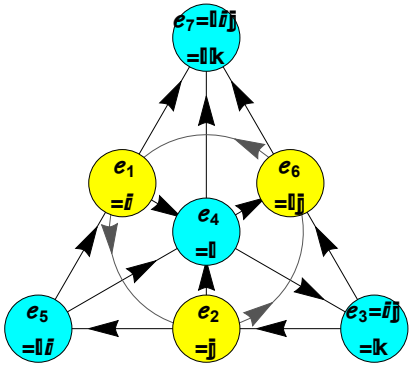
Fano plane



flip=True

{1, 2, 6}{1, 4, 3}{1, 7, 5}{2, 5, 3}{2, 4, 7}{3, 6, 7}{4, 6, 5}

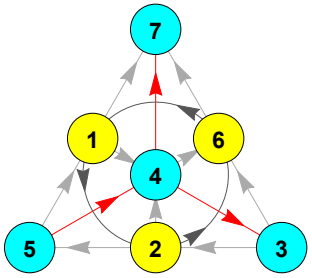
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_4$	e_3	$-e_7$	$-e_2$	e_5
e_2	$-e_6$	−1	$-e_5$	e_7	e_3	e_1	$-e_4$
e_3	e_4	e_5	−1	$-e_1$	$-e_2$	e_7	$-e_6$
e_4	$-e_3$	$-e_7$	e_1	−1	$-e_6$	e_5	e_2
e_5	e_7	$-e_3$	e_2	e_6	−1	$-e_4$	$-e_1$
e_6	e_2	$-e_1$	$-e_7$	$-e_5$	e_4	−1	e_3
e_7	$-e_5$	e_4	e_6	$-e_2$	e_1	$-e_3$	−1

split=1

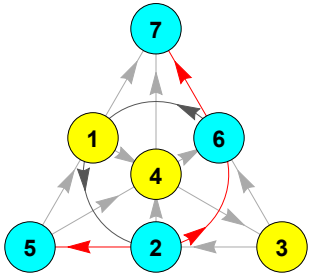
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−4	3	−7	−2	5
2	−6	−1	−5	7	3	1	−4
3	4	5	1	1	2	7	6
4	−3	−7	−1	1	6	5	−2
5	7	−3	−2	−6	1	−4	1
6	2	−1	−7	−5	4	−1	3
7	−5	4	−6	2	−1	−3	1

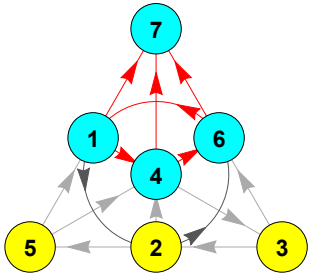
split=2

Fano plane



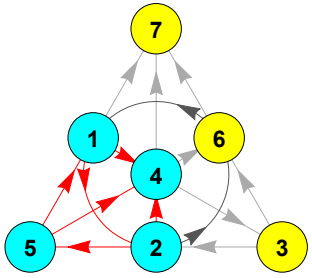
split=4

Fano plane



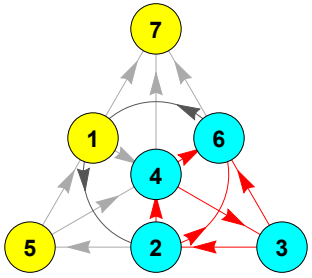
split=6

Fano plane



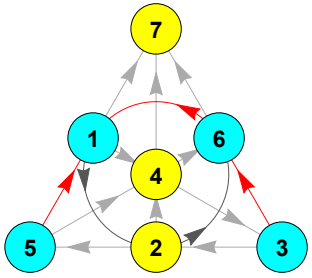
split=3

Fano plane



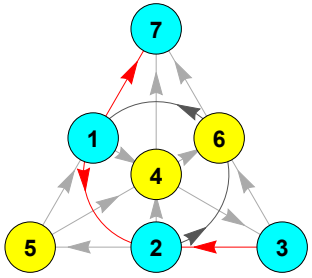
split=5

Fano plane



split=7

Fano plane

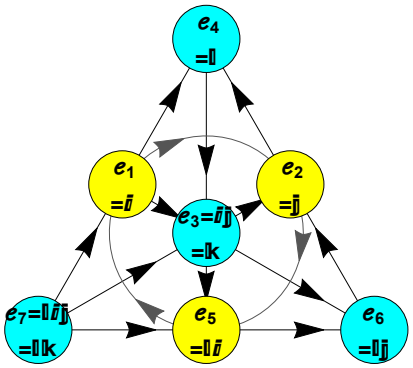


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
216	Y_{wm}^{μ}		0apggsscc 001101000_2	Bn{ 0 0 1 1 1 0 1 1 } E8{ 1 0 0 0 1 0 0 0 }	Cs 55

flip=False

{1, 2, 5}{1, 3, 6}{1, 4, 7}{2, 7, 3}{2, 4, 6}{3, 5, 4}{5, 6, 7}

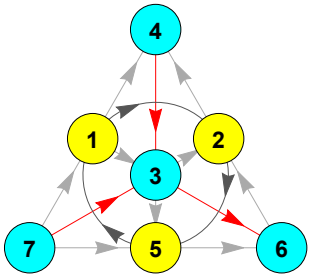
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_6	e_7	$-e_2$	$-e_3$	$-e_4$
e_2	$-e_5$	−1	$-e_7$	e_6	e_1	$-e_4$	e_3
e_3	$-e_6$	e_7	−1	$-e_5$	e_4	e_1	$-e_2$
e_4	$-e_7$	$-e_6$	e_5	−1	$-e_3$	e_2	e_1
e_5	e_2	$-e_1$	$-e_4$	e_3	−1	e_7	$-e_6$
e_6	e_3	e_4	$-e_1$	$-e_2$	$-e_7$	−1	e_5
e_7	e_4	$-e_3$	e_2	$-e_1$	e_6	$-e_5$	−1

split=1

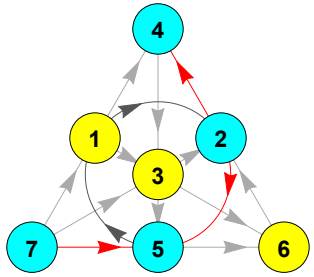
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	6	7	−2	−3	−4
2	−5	−1	−7	6	1	−4	3
3	−6	7	1	5	4	−1	2
4	−7	−6	−5	1	−3	−2	−1
5	2	−1	−4	3	−1	7	−6
6	3	4	1	2	−7	1	−5
7	4	−3	−2	1	6	5	1

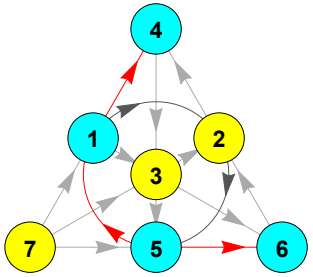
split=2

Fano plane



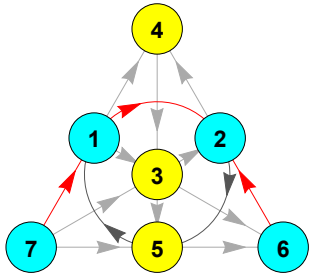
split=4

Fano plane



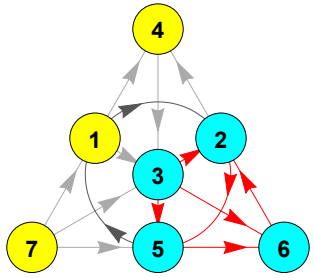
split=6

Fano plane



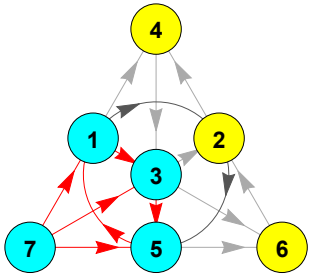
split=3

Fano plane



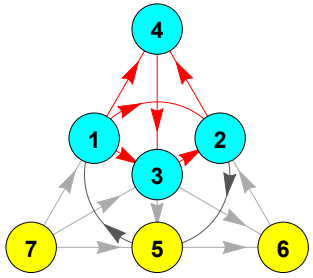
split=5

Fano plane



split=7

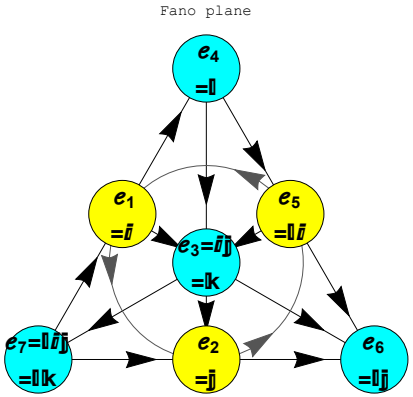
Fano plane



flip=True

{1, 2, 5}{1, 3, 6}{1, 4, 7}{2, 4, 3}{2, 6, 7}{3, 7, 5}{4, 5, 6}

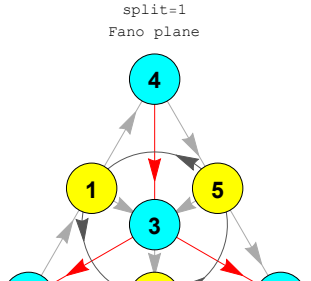
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_5	e_6	e_7	$-e_2$	$-e_3$	$-e_4$
e_2	$-e_5$	−1	$-e_4$	e_3	e_7	$-e_6$	
e_3	$-e_6$	e_4	−1	$-e_2$	$-e_7$	e_1	e_5
e_4	$-e_7$	$-e_3$	e_2	−1	e_6	$-e_5$	e_1
e_5	e_2	$-e_1$	e_7	$-e_6$	−1	e_4	$-e_3$
e_6	e_3	$-e_7$	$-e_1$	e_5	$-e_4$	−1	e_2
e_7	e_4	e_6	$-e_5$	$-e_1$	e_3	$-e_2$	−1

split=1

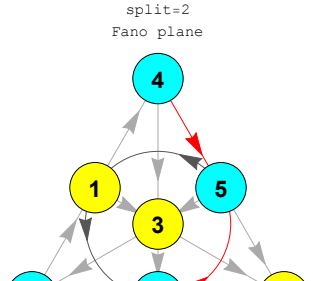
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	6	7	−2	−3	−4
2	−5	−1	−4	3	1	7	−6
3	−6	4	1	2	−7	−1	−5
4	−7	−3	−2	1	6	5	−1
5	2	−1	7	−6	−1	4	−3
6	3	−7	1	−5	−4	1	−2
7	4	6	5	1	3	2	1

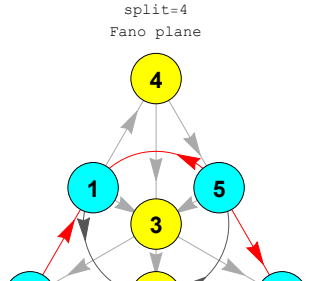
split=2

Fano plane



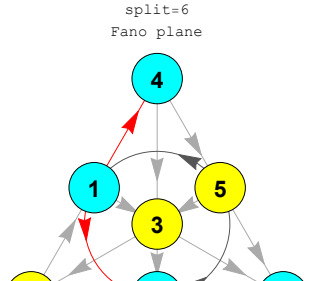
split=4

Fano plane



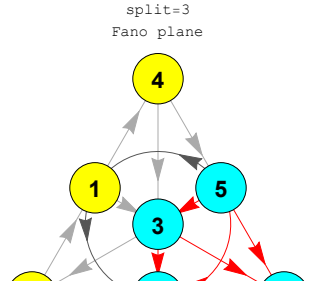
split=6

Fano plane



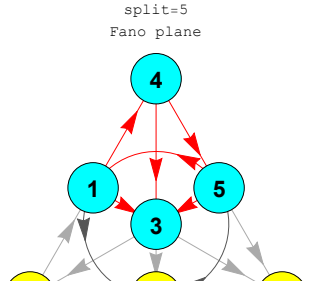
split=3

Fano plane



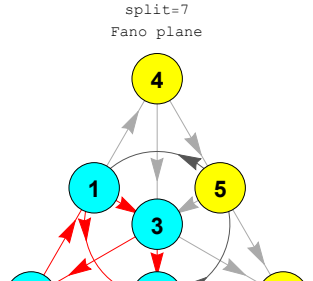
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Quantum Bits Coordinates #

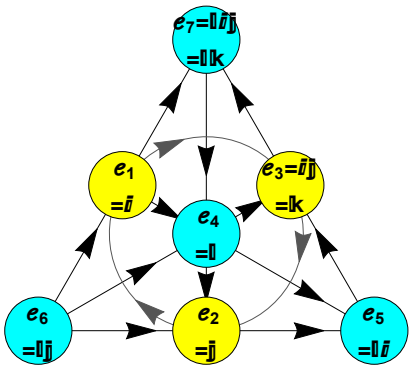
217 $\overline{e_{S\Phi}}_{r_1}^{\mathbb{R}^{0\to-1}}$ 0apggsscc Bn{ 0 0 1 1 0 1 1 1 } Sm

011000101_2 E8{ 1 0 0 1 0 0 0 0 } 62

flip=False

{1, 3, 2}{1, 4, 5}{1, 7, 6}{2, 7, 4}{2, 5, 6}{3, 6, 4}{3, 7, 5}

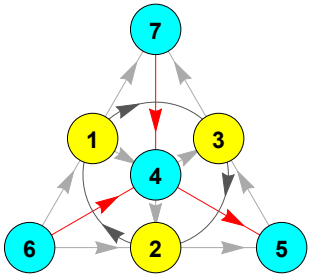
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_3$	e_2	e_5	$-e_4$	$-e_7$	e_6
e_2	e_3	e_3	−1	$-e_1$	$-e_7$	e_6	$-e_5$	e_4
e_3	$-e_2$	e_1	$-e_1$	−1	$-e_6$	$-e_7$	e_4	e_5
e_4	$-e_5$	e_7	e_6	$-e_6$	−1	e_1	$-e_3$	$-e_2$
e_5	e_4	$-e_6$	e_7	$-e_7$	e_1	−1	e_2	$-e_3$
e_6	e_7	e_5	$-e_4$	e_3	$-e_2$	e_1	−1	$-e_1$
e_7	$-e_6$	$-e_4$	$-e_5$	e_2	e_3	e_1	e_7	−1

split=1

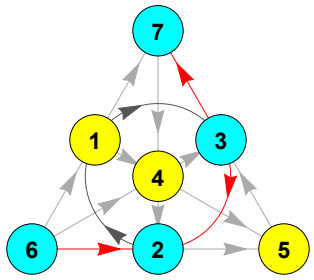
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	5	−4	−7	6
2	3	−1	−1	−7	6	−5	4
3	−2	1	−1	−6	−7	4	5
4	−5	7	6	1	−1	3	2
5	4	−6	7	1	1	−2	3
6	7	5	−4	−3	2	1	1
7	−6	−4	−5	−2	−3	−1	1

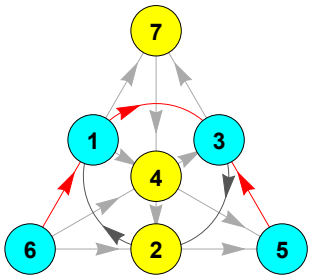
split=2

Fano plane



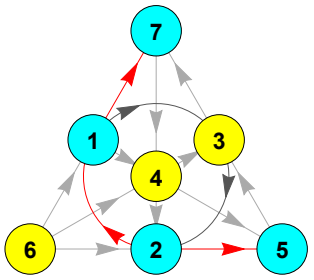
split=4

Fano plane



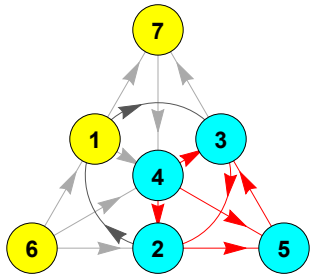
split=6

Fano plane



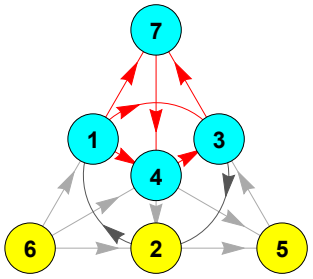
split=3

Fano plane



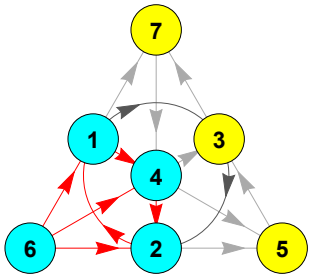
split=5

Fano plane



split=7

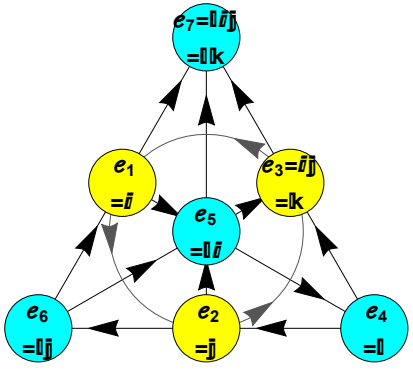
Fano plane



flip=True

{1, 2, 3}{1, 5, 4}{1, 7, 6}{2, 6, 4}{2, 5, 7}{3, 7, 4}{3, 6, 5}

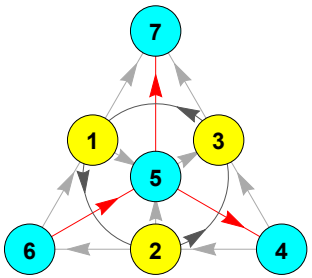
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	$-e_5$	e_4	$-e_7$	e_6
e_2	$-e_3$	-1	e_1	$-e_6$	e_7	e_4	$-e_5$	
e_3	e_2	$-e_1$	-1	$-e_7$	$-e_6$	e_5	e_4	
e_4	e_5	e_6	e_7	-1	$-e_1$	$-e_2$	$-e_3$	
e_5	$-e_4$	$-e_7$	e_6	e_1	-1	$-e_3$	e_2	
e_6	e_7	$-e_4$	$-e_5$	e_2	e_3	-1	$-e_1$	
e_7	$-e_6$	e_5	$-e_4$	e_3	$-e_2$	e_1	-1	

split=1

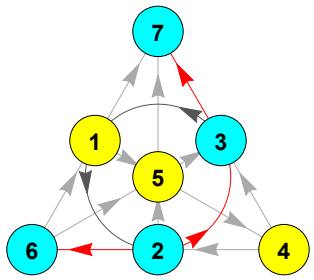
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−5	4	−7	6
2	−3	−1	1	−6	7	4	−5
3	2	−1	−1	−7	−6	5	4
4	5	6	7	1	1	2	3
5	−4	−7	6	−1	1	3	−2
6	7	−4	−5	−2	−3	1	1
7	−6	5	−4	−3	2	−1	1

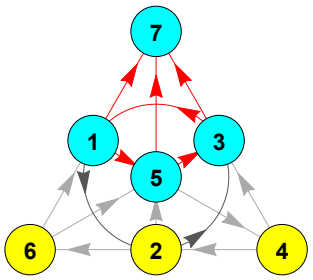
split=2

Fano plane



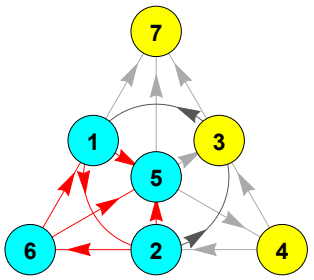
split=4

Fano plane



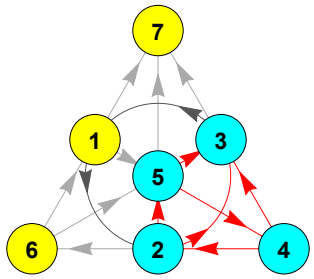
split=6

Fano plane



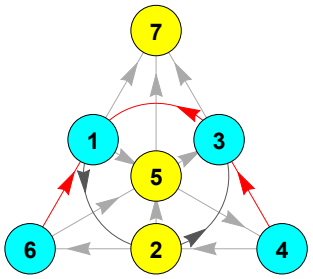
split=3

Fano plane



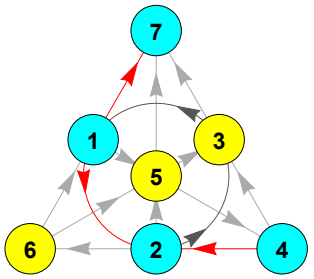
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

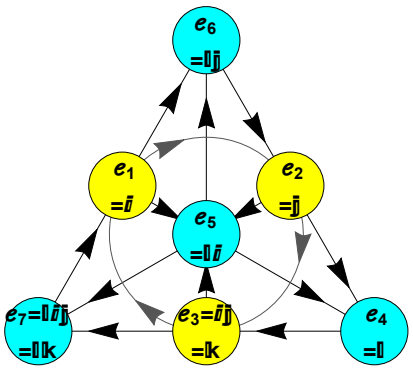
Quantum Bits Coordinates #

218 $e_{8}\phi^{0}_{rm}{}^{0}_{L}$

0apggsscc Bn{ 0 0 1 0 1 1 1 1 } Er
001001001_2 E8{ 1 0 1 0 0 0 0 0 } 68

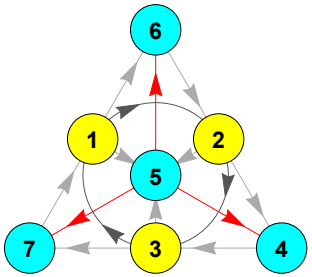
flip=False
{1, 2, 3}{1, 5, 4}{1, 6, 7}{2, 4, 6}{2, 5, 7}{3, 7, 4}{3, 5, 6}

Fano plane



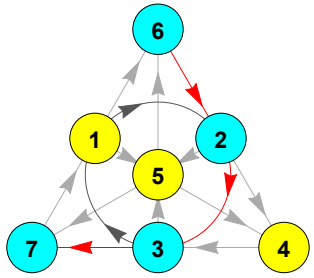
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_3	$-e_2$	$-e_5$	e_4	e_7	$-e_6$
e_2	$-e_3$	−1	e_1	e_6	e_7	$-e_4$	$-e_5$
e_3	e_2	$-e_1$	−1	$-e_7$	e_6	$-e_5$	e_4
e_4	e_5	$-e_6$	e_7	−1	$-e_1$	e_2	$-e_3$
e_5	$-e_4$	$-e_7$	$-e_6$	e_1	−1	e_3	e_2
e_6	$-e_7$	e_4	e_5	$-e_2$	$-e_3$	−1	e_1
e_7	e_6	e_5	$-e_4$	e_3	$-e_2$	$-e_1$	−1

split=1
Fano plane

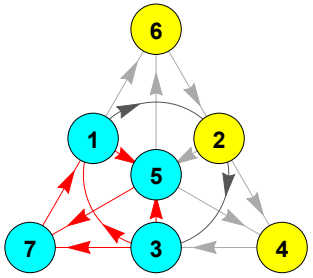


0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−5	4	7	−6
2	−3	−1	1	6	7	−4	−5
3	2	−1	−1	−7	6	−5	4
4	5	−6	7	1	1	−2	3
5	−4	−7	−6	−1	1	−3	−2
6	−7	4	5	2	3	1	−1
7	6	5	−4	−3	2	1	1

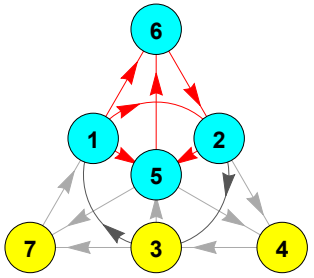
split=2
Fano plane



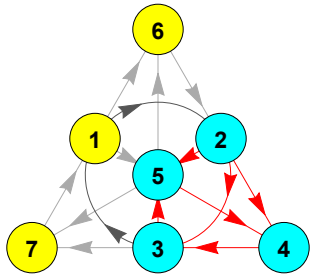
split=4
Fano plane



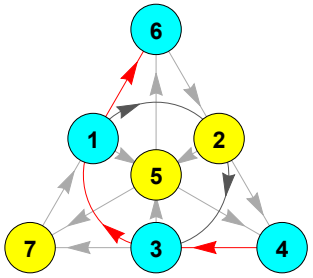
split=6
Fano plane



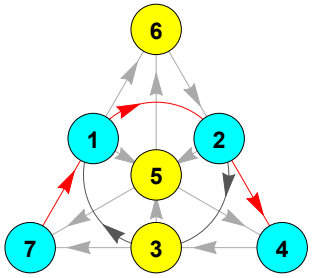
split=3
Fano plane



split=5
Fano plane

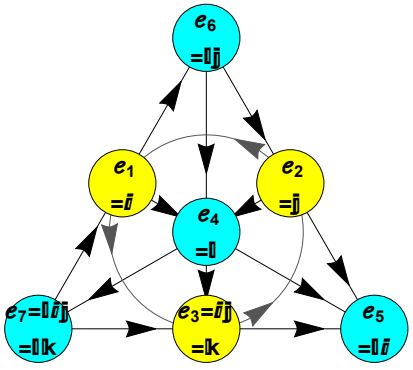


split=7
Fano plane



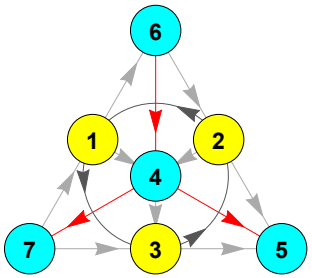
flip=True
{1, 3, 2}{1, 4, 5}{1, 6, 7}{2, 4, 7}{2, 5, 6}{3, 6, 4}{3, 5, 7}

Fano plane



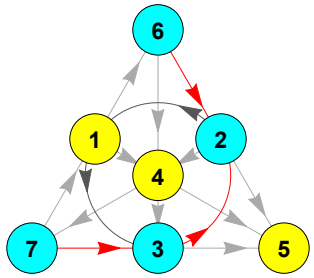
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	e_5	$-e_4$	e_7	$-e_6$
e_2	e_3	−1	$-e_1$	e_7	e_6	$-e_5$	$-e_4$
e_3	$-e_2$	e_1	−1	$-e_6$	e_7	e_4	$-e_5$
e_4	$-e_5$	$-e_7$	e_6	−1	e_1	$-e_3$	e_2
e_5	e_4	$-e_6$	$-e_7$	$-e_1$	−1	e_2	e_3
e_6	$-e_7$	e_5	$-e_4$	e_3	$-e_2$	−1	e_1
e_7	e_6	e_4	e_5	$-e_2$	$-e_3$	$-e_1$	−1

split=1
Fano plane

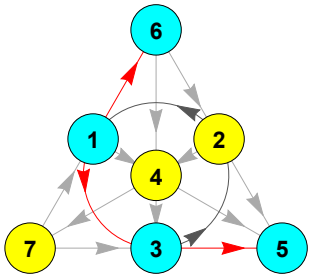


0↦1	1	2	3	4	5	6	7
1	−1	−3	2	5	−4	7	−6
2	3	−1	−1	7	6	−5	−4
3	−2	1	−1	−6	7	4	−5
4	−5	−7	6	1	−1	3	−2
5	4	−6	−7	1	1	−2	−3
6	−7	5	−4	−3	2	1	−1
7	6	4	5	2	3	1	1

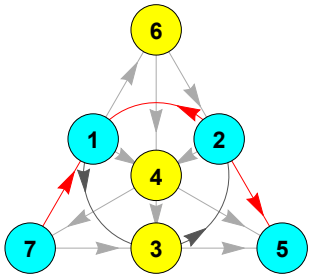
split=2
Fano plane



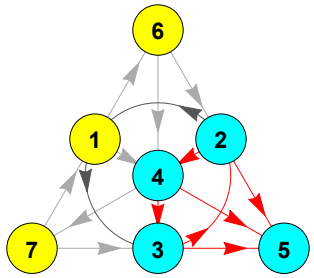
split=4
Fano plane



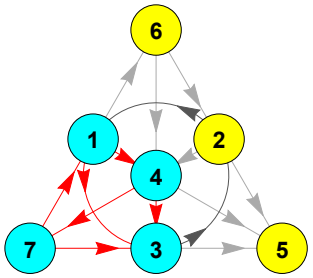
split=6
Fano plane



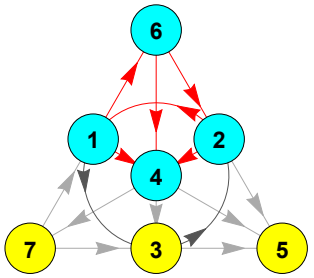
split=3
Fano plane



split=5
Fano plane



split=7
Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

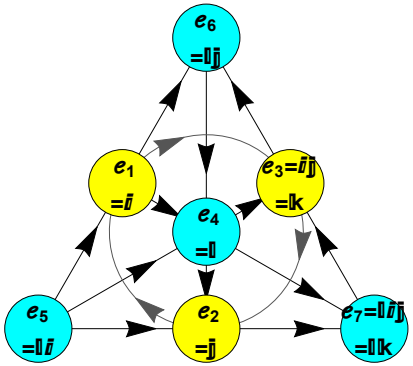
Quantum Bits Coordinates #

219 W 0 bm R

0apggsscc Bn{ 0 0 0 1 1 1 1 1 } W
001001111₂ E8{ 1 1 0 0 0 0 0 0 } 74

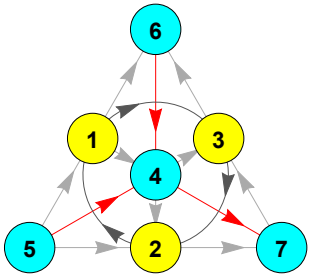
flip=False
{1, 3, 2}{1, 4, 7}{1, 6, 5}{2, 6, 4}{2, 7, 5}{3, 5, 4}{3, 6, 7}

Fano plane



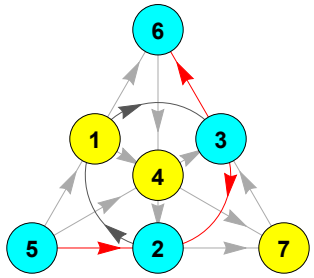
	e1	e2	e3	e4	e5	e6	e7
e1	-1	-e3	e2	e7	-e6	e5	-e4
e2	e3	-1	-e1	-e6	-e7	e4	e5
e3	-e2	e1	-1	-e5	e4	e7	-e6
e4	-e7	e6	e5	-1	-e3	-e2	e1
e5	e6	e7	-e4	e3	-1	-e1	-e2
e6	-e5	-e4	-e7	e2	e1	-1	e3
e7	e4	-e5	e6	-e1	e2	-e3	-1

split=1
Fano plane

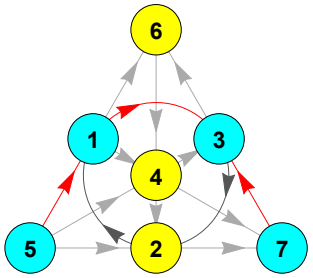


0↦1	1	2	3	4	5	6	7
1	-1	-3	2	7	-6	5	-4
2	3	-1	-1	-6	-7	4	5
3	-2	1	-1	-5	4	7	-6
4	-7	6	5	1	3	2	-1
5	6	7	-4	-3	1	1	2
6	-5	-4	-7	-2	-1	1	-3
7	4	-5	6	1	-2	3	1

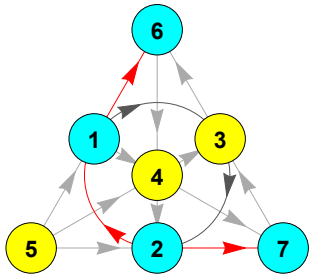
split=2
Fano plane



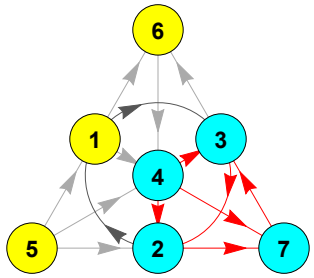
split=4
Fano plane



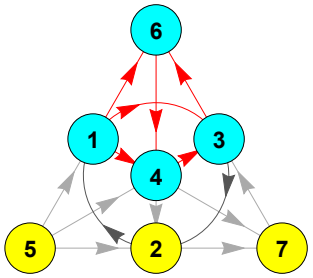
split=6
Fano plane



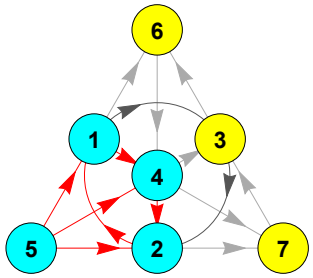
split=3
Fano plane



split=5
Fano plane

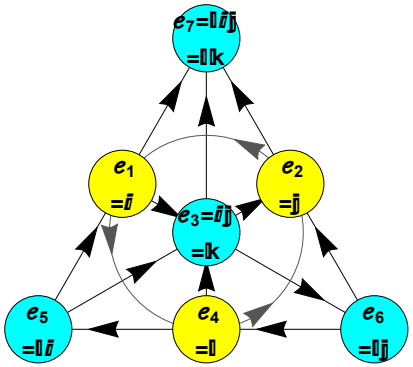


split=7
Fano plane



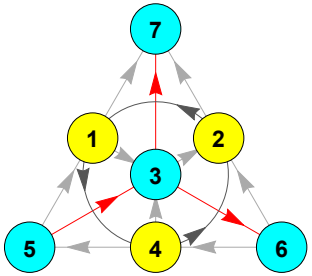
flip=True
{1, 4, 2}{1, 3, 6}{1, 7, 5}{2, 5, 3}{2, 7, 6}{3, 7, 4}{4, 5, 6}

Fano plane



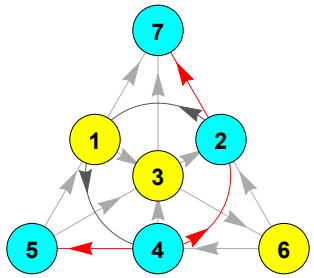
	e1	e2	e3	e4	e5	e6	e7
e1	-1	-e4	e6	e2	-e7	-e3	e5
e2	e4	-1	-e5	-e1	e3	-e7	e6
e3	-e6	e5	-1	-e7	-e2	e1	e4
e4	-e2	e1	e7	-1	e6	-e5	-e3
e5	e7	-e3	e2	-e6	-1	e4	-e1
e6	e3	e7	-e1	e5	-e4	-1	-e2
e7	-e5	-e6	-e4	e3	e1	e2	-1

split=1
Fano plane

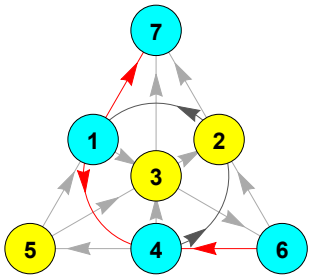


0↦1	1	2	3	4	5	6	7
1	-1	-4	6	2	-7	-3	5
2	4	-1	-5	-1	3	-7	6
3	-6	5	1	-7	2	-1	-4
4	-2	1	7	-1	6	-5	-3
5	7	-3	-2	-6	1	-4	1
6	3	7	1	5	4	1	2
7	-5	-6	4	3	-1	-2	1

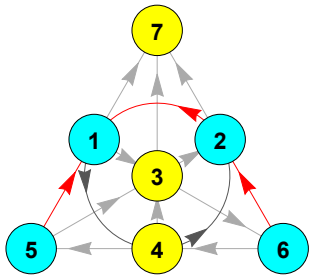
split=2
Fano plane



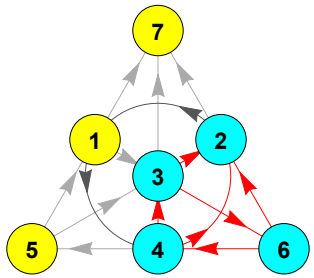
split=4
Fano plane



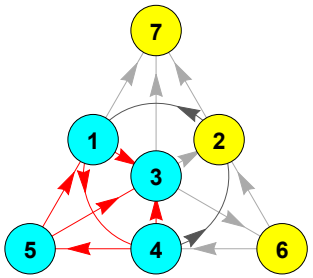
split=6
Fano plane



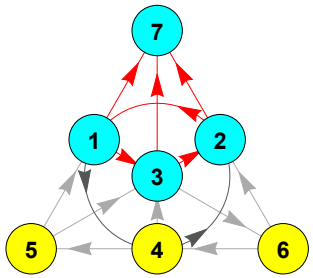
split=3
Fano plane



split=5
Fano plane



split=7
Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

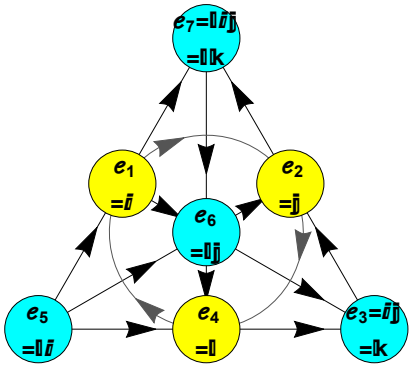
Quantum Bits Coordinates #

220 $\frac{\bar{u}}{r_1}^{0\to -2/3}$ 0apggsscc 0110101012 Bn{ 1 1 1 1 1 1 0 0 } E8{ 1/2 1/2 1/2 1/2 1/2 1/2 -1/2 -1/2 } Rg 111

flip=False

{1, 2, 4}{1, 6, 3}{1, 7, 5}{2, 7, 3}{2, 5, 6}{3, 5, 4}{4, 7, 6}

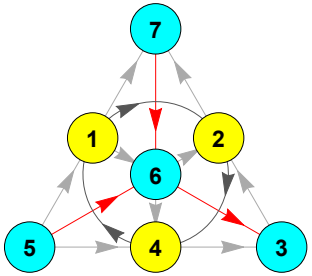
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_4	$-e_6$	$-e_2$	$-e_7$	e_3	e_5
e_2	e_2	$-e_4$	-1	$-e_7$	e_1	e_6	$-e_5$	e_3
e_3	e_3	e_6	e_7	-1	$-e_5$	e_4	$-e_1$	$-e_2$
e_4	e_4	e_2	$-e_1$	e_5	-1	$-e_3$	$-e_7$	e_6
e_5	e_5	e_7	$-e_6$	$-e_4$	e_3	-1	e_2	$-e_1$
e_6	e_6	$-e_3$	e_5	e_1	e_7	$-e_2$	-1	$-e_4$
e_7	e_7	$-e_5$	$-e_3$	e_2	$-e_6$	e_1	e_4	-1

split=1

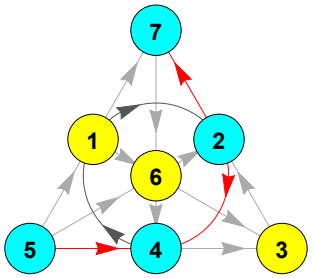
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	4	-6	-2	-7	3	5
2	-4	-1	-7	1	6	-5	3
3	6	7	1	-5	-4	1	2
4	2	-1	5	-1	-3	-7	6
5	7	-6	4	3	1	-2	1
6	-3	5	-1	7	2	1	4
7	-5	-3	-2	-6	-1	-4	1

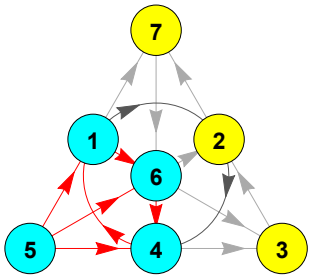
split=2

Fano plane



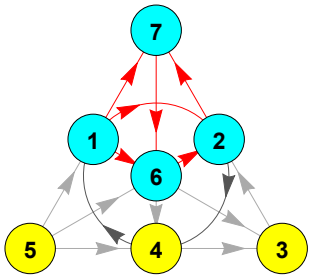
split=4

Fano plane



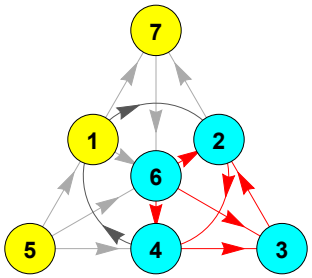
split=6

Fano plane



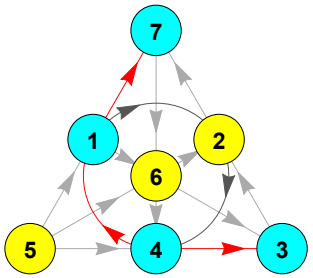
split=3

Fano plane



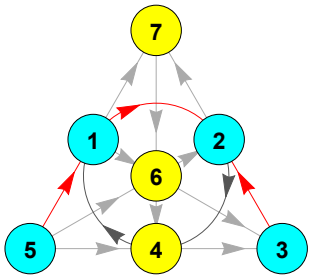
split=5

Fano plane



split=7

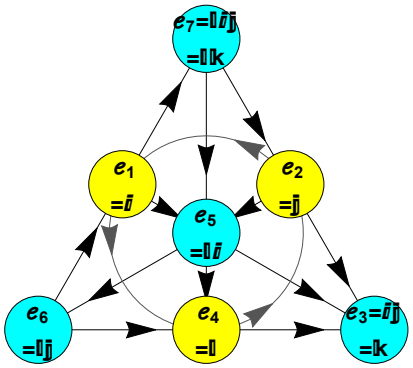
Fano plane



flip=True

{1, 4, 2}{1, 5, 3}{1, 7, 6}{2, 3, 7}{2, 5, 6}{3, 6, 4}{4, 7, 5}

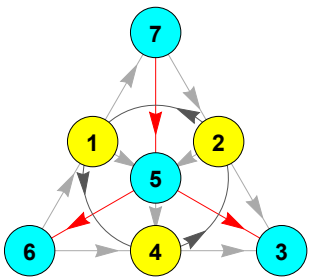
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_4	e_5	$-e_2$	e_3	$-e_7$	e_6
e_2	e_2	$-e_4$	-1	e_7	e_1	e_6	$-e_5$	$-e_3$
e_3	e_3	e_5	$-e_7$	-1	$-e_6$	$-e_1$	e_4	e_2
e_4	e_4	$-e_2$	e_1	e_6	-1	$-e_7$	$-e_3$	e_5
e_5	e_5	$-e_3$	$-e_6$	e_1	e_7	-1	e_2	$-e_4$
e_6	e_6	e_7	e_5	$-e_4$	e_3	$-e_2$	-1	$-e_1$
e_7	e_7	$-e_6$	e_3	$-e_2$	$-e_5$	e_4	e_1	-1

split=1

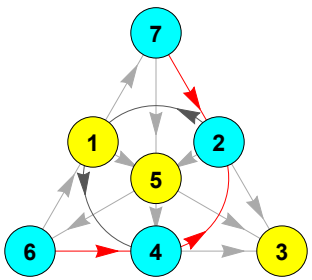
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	-5	2	3	-7	6
2	4	-1	7	-1	6	-5	-3
3	5	-7	1	-6	1	-4	-2
4	-2	1	6	-1	-7	-3	5
5	-3	-6	-1	7	1	-2	4
6	7	5	4	3	2	1	1
7	-6	3	2	-5	-4	-1	1

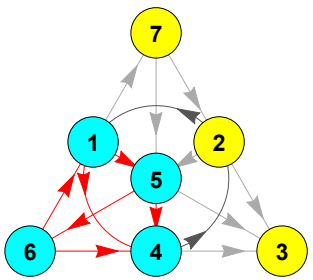
split=2

Fano plane



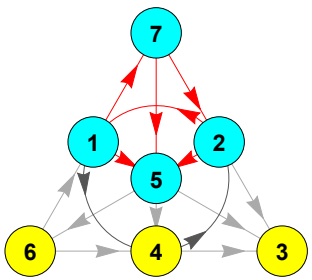
split=4

Fano plane



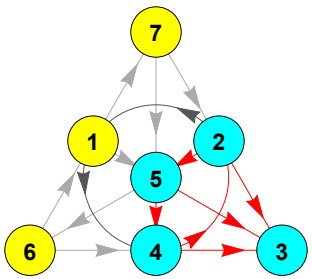
split=6

Fano plane



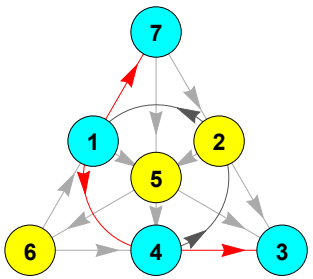
split=3

Fano plane



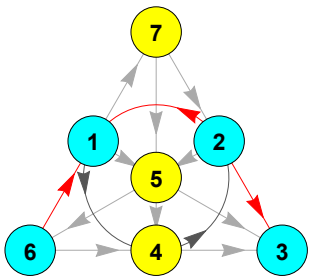
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

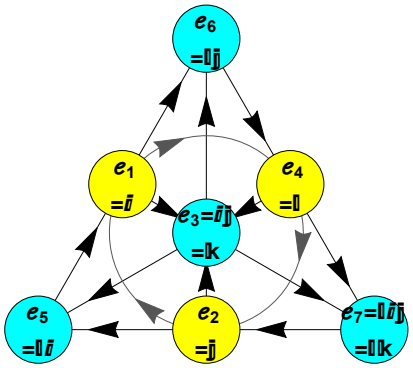
Quantum Bits Coordinates #

221 $\overline{u}_{g_1}^{0\to -2/3}$ 0apggsscc 011010110$_2$ Bn{ 1 1 1 1 1 0 1 0 } Mt
E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ } 109

flip=False

{1, 4, 2}{1, 3, 7}{1, 6, 5}{2, 3, 6}{2, 5, 7}{3, 5, 4}{4, 7, 6}

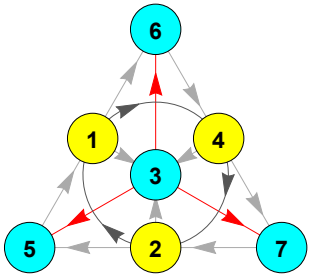
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_4$	e_7	e_2	$-e_6$	e_5	$-e_3$
e_2	e_2	e_4	−1	e_6	$-e_1$	e_7	$-e_3$	$-e_5$
e_3	e_3	$-e_7$	$-e_6$	−1	$-e_5$	e_4	e_2	e_1
e_4	e_4	$-e_2$	e_1	e_5	−1	$-e_3$	$-e_7$	e_6
e_5	e_5	e_6	$-e_7$	$-e_4$	e_3	−1	$-e_1$	e_2
e_6	e_6	$-e_5$	e_3	$-e_2$	e_7	e_1	−1	$-e_4$
e_7	e_7	e_3	e_5	$-e_1$	$-e_6$	$-e_2$	e_4	−1

split=1

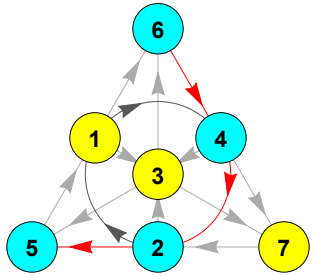
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	7	2	−6	5	−3
2	4	−1	6	−1	7	−3	−5
3	−7	−6	1	−5	−4	−2	−1
4	−2	1	5	−1	−3	−7	6
5	6	−7	4	3	1	1	−2
6	−5	3	2	7	−1	1	4
7	3	5	1	−6	2	−4	1

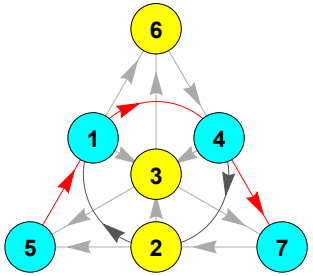
split=2

Fano plane



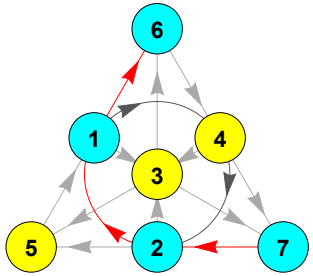
split=4

Fano plane



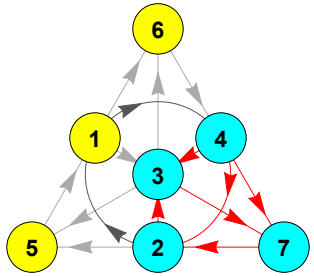
split=6

Fano plane



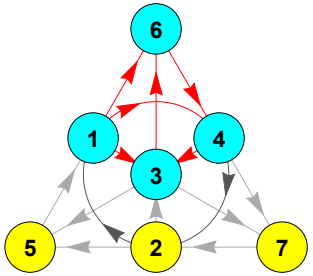
split=3

Fano plane



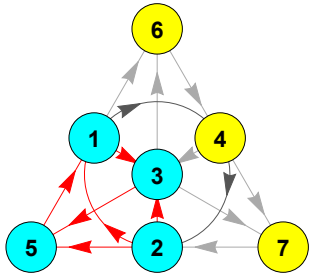
split=5

Fano plane



split=7

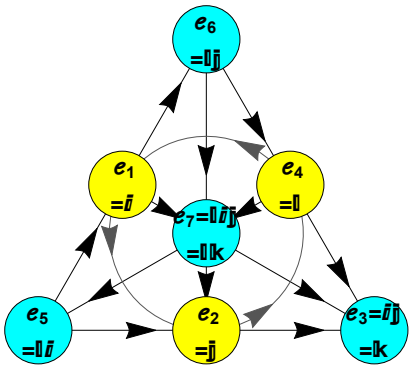
Fano plane



flip=True

{1, 2, 4}{1, 7, 3}{1, 6, 5}{2, 3, 5}{2, 6, 7}{3, 6, 4}{4, 7, 5}

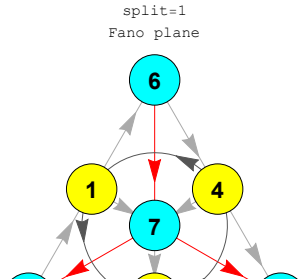
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	$-e_7$	$-e_2$	$-e_6$	e_5	e_3
e_2	e_2	$-e_4$	−1	e_5	e_1	$-e_3$	e_7	$-e_6$
e_3	e_3	e_7	$-e_5$	−1	$-e_6$	e_2	e_4	$-e_1$
e_4	e_4	e_2	$-e_1$	e_6	−1	$-e_7$	$-e_3$	e_5
e_5	e_5	e_6	e_3	$-e_2$	e_7	−1	$-e_1$	$-e_4$
e_6	e_6	$-e_5$	$-e_7$	$-e_4$	e_3	e_1	−1	e_2
e_7	e_7	$-e_3$	e_6	e_1	$-e_5$	e_4	$-e_2$	−1

split=1

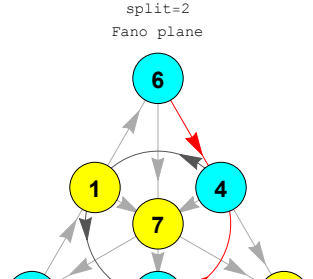
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−7	−2	−6	5	3
2	−4	−1	5	1	−3	7	−6
3	7	−5	1	−6	−2	−4	1
4	2	−1	6	−1	−7	−3	5
5	6	3	2	7	1	1	4
6	−5	−7	4	3	−1	1	−2
7	−3	6	−1	−5	−4	2	1

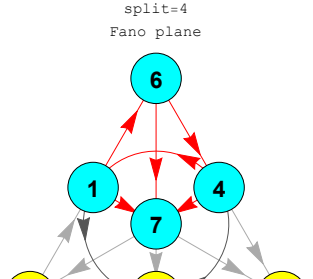
split=2

Fano plane



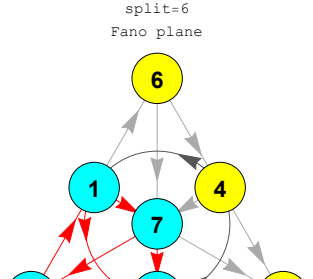
split=4

Fano plane



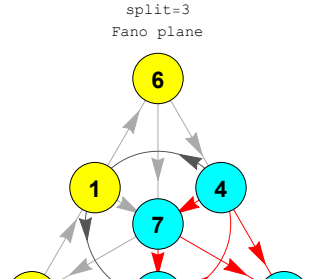
split=6

Fano plane



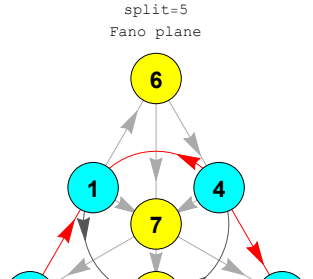
split=3

Fano plane



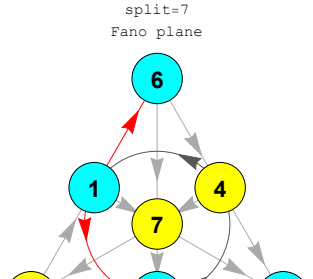
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Quantum Bits Coordinates #

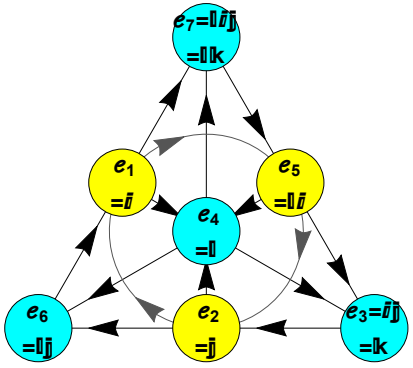
222 $\overline{u}_{P_1}^{-2/3}$ 0apggsscc 011010111$_2$ Bn{ 1 1 1 1 1 0 0 1 } $\overline{\text{Na}}$ 11

E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }

flip=False

{1, 5, 2}{1, 4, 3}{1, 7, 6}{2, 6, 3}{2, 4, 7}{3, 7, 5}{4, 6, 5}

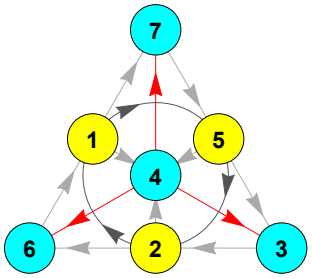
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_5$	$-e_4$	e_3	e_2	$-e_7$	e_6
e_2	e_2	e_5	−1	$-e_6$	e_7	$-e_1$	e_3	$-e_4$
e_3	e_3	e_4	e_6	−1	$-e_1$	$-e_7$	$-e_2$	e_5
e_4	e_4	$-e_3$	$-e_7$	e_1	−1	$-e_6$	e_5	e_2
e_5	e_5	$-e_2$	e_1	e_7	e_6	−1	$-e_4$	$-e_3$
e_6	e_6	e_7	$-e_3$	e_2	$-e_5$	e_4	−1	$-e_1$
e_7	e_7	$-e_6$	e_4	$-e_5$	$-e_2$	e_3	e_1	−1

split=1

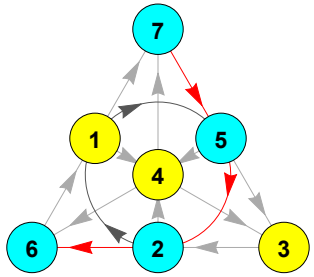
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	−4	3	2	−7	6
2	5	−1	−6	7	−1	3	−4
3	4	6	1	1	−7	2	−5
4	−3	−7	−1	1	−6	−5	−2
5	−2	1	7	6	−1	−4	−3
6	7	−3	−2	5	4	1	1
7	−6	4	5	2	3	−1	1

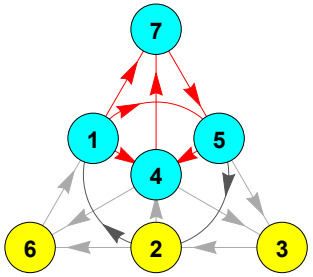
split=2

Fano plane



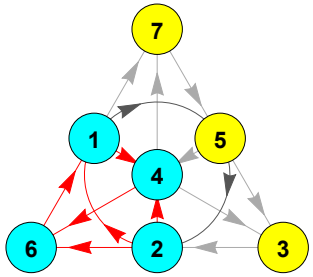
split=4

Fano plane



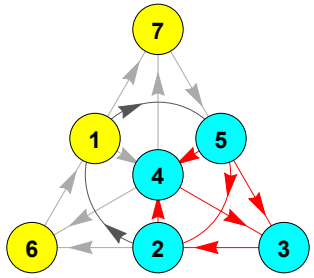
split=6

Fano plane



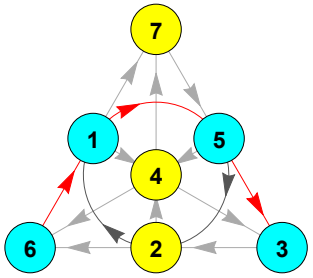
split=3

Fano plane



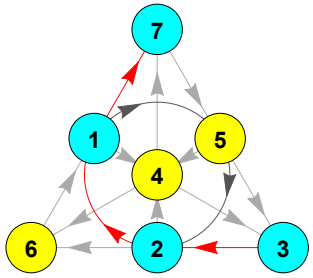
split=5

Fano plane



split=7

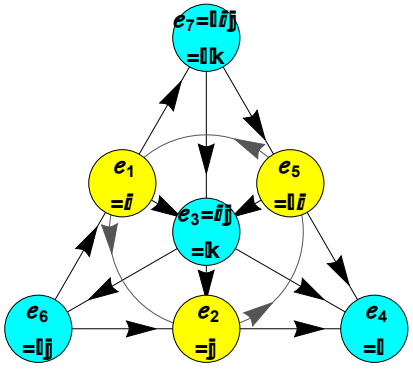
Fano plane



flip=True

{1, 2, 5}{1, 3, 4}{1, 7, 6}{2, 7, 3}{2, 4, 6}{3, 6, 5}{4, 7, 5}

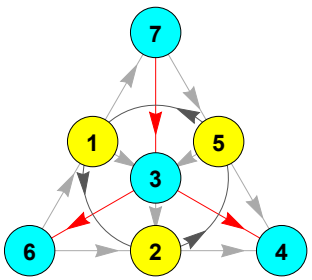
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	e_4	$-e_3$	$-e_2$	$-e_7$	e_6
e_2	e_2	$-e_5$	−1	$-e_7$	e_6	e_1	$-e_4$	e_3
e_3	e_3	$-e_4$	e_7	−1	e_1	$-e_6$	e_5	$-e_2$
e_4	e_4	e_3	$-e_6$	$-e_1$	−1	$-e_7$	e_2	e_5
e_5	e_5	e_2	$-e_1$	e_6	e_7	−1	$-e_3$	$-e_4$
e_6	e_6	e_7	e_4	$-e_5$	$-e_2$	e_3	−1	$-e_1$
e_7	e_7	$-e_6$	$-e_3$	e_2	$-e_5$	e_4	e_1	−1

split=1

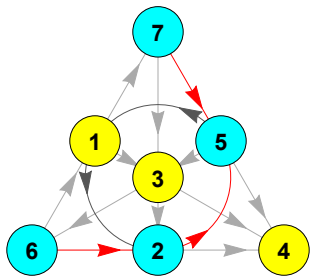
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	4	−3	−2	−7	6
2	−5	−1	−7	6	1	−4	3
3	−4	7	1	−1	−6	−5	2
4	3	−6	1	1	−7	−2	−5
5	2	−1	6	7	−1	−3	−4
6	7	4	5	2	3	1	1
7	−6	−3	−2	5	4	−1	1

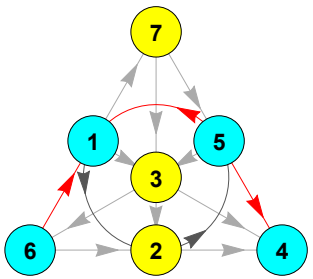
split=2

Fano plane



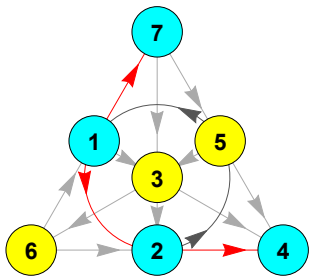
split=4

Fano plane



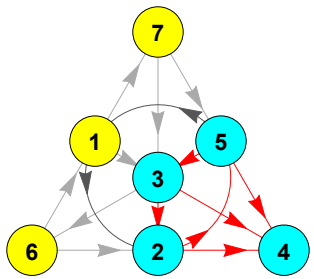
split=6

Fano plane



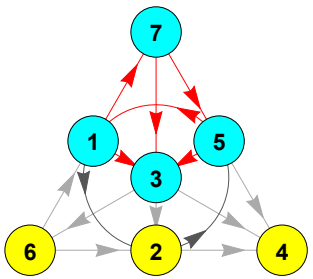
split=3

Fano plane



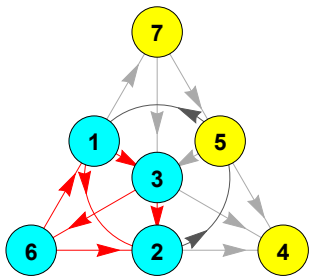
split=5

Fano plane



split=7

Fano plane



Seq # Symbol 2D/3D Shape Particle Binary / E8 Ele

Quantum Bits Coordinates #

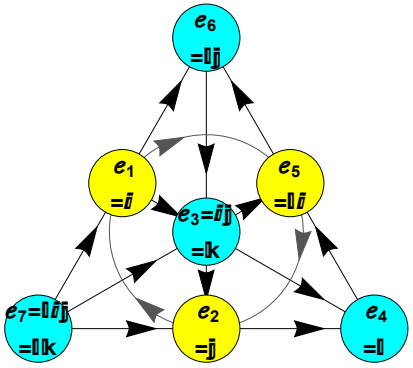
223 $d_{m_d}^{-1/3}$ 0apggsscc Bn{ 1 1 1 1 0 1 1 0 } Hs

000010011_2 E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ } 108

flip=False

{1, 5, 2}{1, 3, 4}{1, 6, 7}{2, 6, 3}{2, 4, 7}{3, 5, 7}{4, 5, 6}

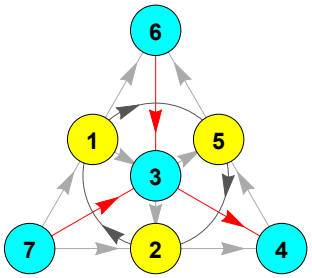
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_5$	e_4	$-e_3$	e_2	e_7	$-e_6$
e_2	e_2	e_5	−1	$-e_6$	e_7	$-e_1$	e_3	$-e_4$
e_3	e_3	$-e_4$	e_6	−1	e_1	e_7	$-e_2$	$-e_5$
e_4	e_4	e_3	$-e_7$	$-e_1$	−1	e_6	$-e_5$	e_2
e_5	e_5	$-e_2$	e_1	$-e_7$	$-e_6$	−1	e_4	e_3
e_6	e_6	e_7	e_3	e_2	e_5	$-e_4$	−1	e_1
e_7	e_7	e_6	e_4	e_5	$-e_2$	$-e_3$	$-e_1$	−1

split=1

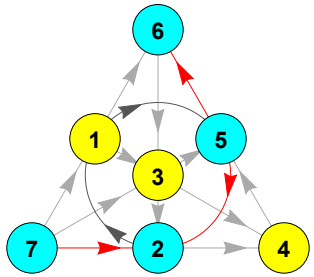
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−5	4	−3	2	7	−6
2	5	−1	−6	7	−1	3	−4
3	−4	6	1	−1	7	2	5
4	3	−7	1	1	6	5	−2
5	−2	1	−7	−6	−1	4	3
6	−7	−3	−2	−5	−4	1	−1
7	6	4	−5	2	−3	1	1

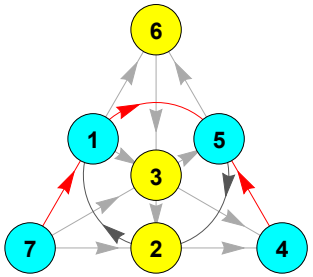
split=2

Fano plane



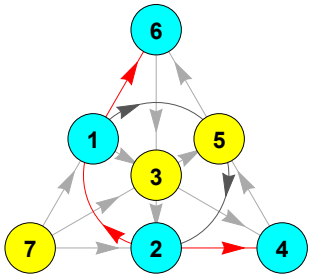
split=4

Fano plane



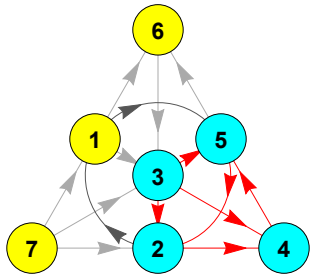
split=6

Fano plane



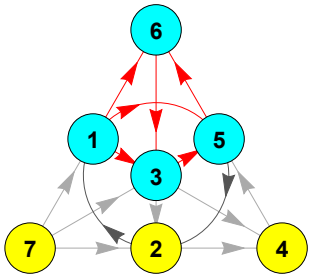
split=3

Fano plane



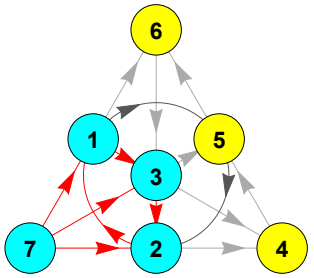
split=5

Fano plane



split=7

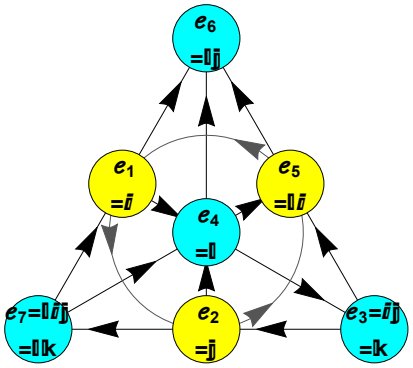
Fano plane



flip=True

{1, 2, 5}{1, 4, 3}{1, 6, 7}{2, 7, 3}{2, 4, 6}{3, 5, 6}{4, 5, 7}

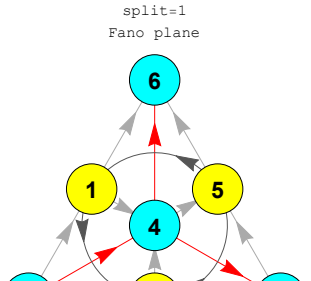
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_5	$-e_4$	e_3	$-e_2$	e_7	$-e_6$
e_2	e_2	$-e_5$	−1	$-e_7$	e_6	e_1	$-e_4$	e_3
e_3	e_3	e_4	e_7	−1	$-e_1$	e_6	$-e_5$	$-e_2$
e_4	e_4	$-e_3$	$-e_6$	e_1	−1	e_7	e_2	$-e_5$
e_5	e_5	e_2	$-e_1$	$-e_6$	$-e_7$	−1	e_3	e_4
e_6	e_6	$-e_7$	e_4	e_5	$-e_2$	$-e_3$	−1	e_1
e_7	e_7	e_6	$-e_3$	e_2	e_5	$-e_4$	$-e_1$	−1

split=1

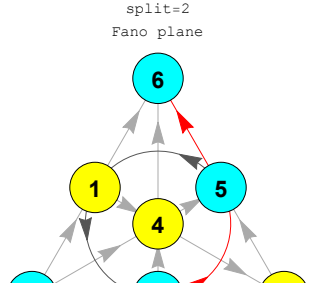
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	5	−4	3	−2	7	−6
2	−5	−1	−7	6	1	−4	3
3	4	7	1	1	6	5	2
4	−3	−6	−1	1	7	−2	5
5	2	−1	−6	−7	−1	3	4
6	−7	4	−5	2	−3	1	−1
7	6	−3	−2	−5	−4	1	1

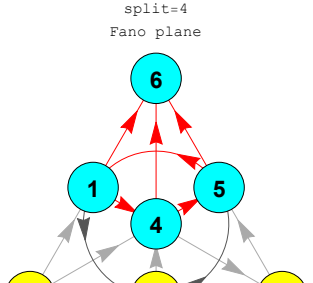
split=2

Fano plane



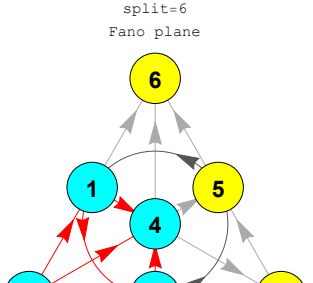
split=4

Fano plane



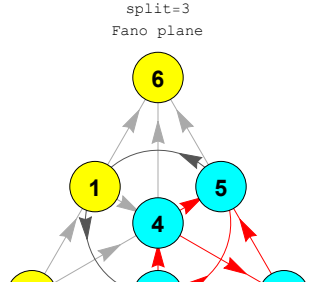
split=6

Fano plane



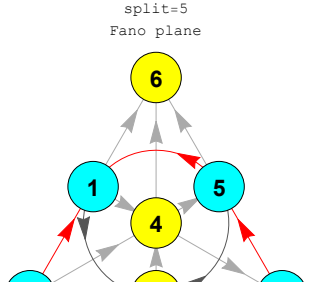
split=3

Fano plane



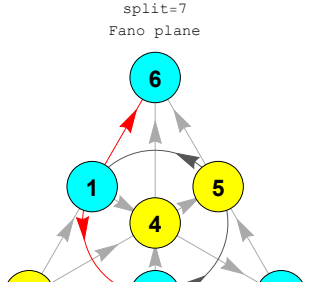
split=5

Fano plane



split=7

Fano plane

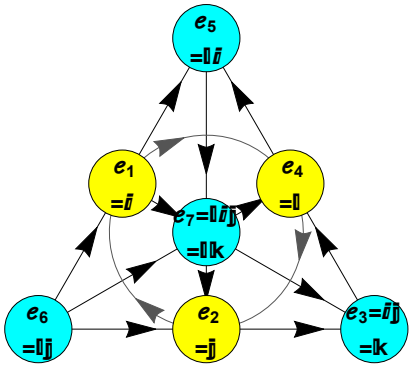


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
224	$d_{c_d}^{\to -1/3}$	■ ◆	0apggsscc 000010010_2	Bn{ 1 1 1 1 0 1 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{Cl}}$ 17

flip=False

{1, 4, 2}{1, 7, 3}{1, 5, 6}{2, 3, 6}{2, 5, 7}{3, 4, 5}{4, 6, 7}

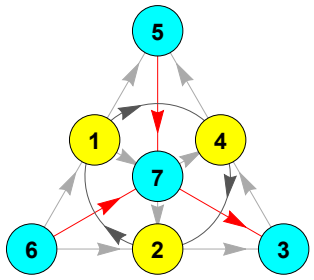
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_4$	$-e_7$	e_2	e_6	$-e_5$	e_3
e_2	e_2	e_4	−1	e_6	$-e_1$	e_7	$-e_3$	$-e_5$
e_3	e_3	e_7	$-e_6$	−1	e_5	$-e_4$	e_2	$-e_1$
e_4	e_4	$-e_2$	e_1	$-e_5$	−1	e_3	e_7	$-e_6$
e_5	e_5	$-e_6$	e_7	e_4	$-e_3$	−1	e_1	e_2
e_6	e_6	e_5	e_3	$-e_2$	$-e_7$	$-e_1$	−1	e_4
e_7	e_7	$-e_3$	e_5	e_1	e_6	$-e_2$	$-e_4$	−1

split=1

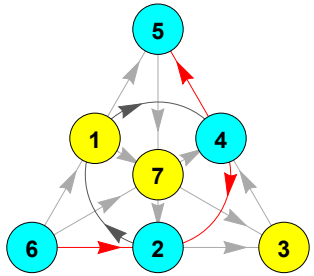
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−7	2	6	−5	3
2	4	−1	6	−1	7	−3	−5
3	7	−6	1	5	4	−2	1
4	−2	1	−5	−1	3	7	−6
5	−6	−7	−4	−3	1	−1	−2
6	5	3	2	−7	1	1	−4
7	−3	5	−1	6	2	4	1

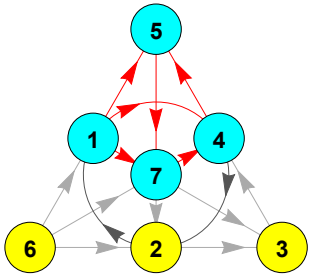
split=2

Fano plane



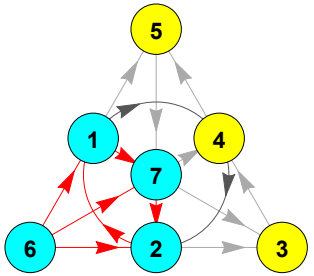
split=4

Fano plane



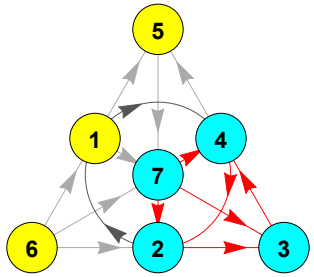
split=6

Fano plane



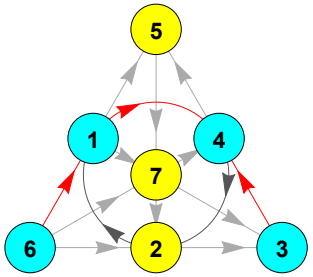
split=3

Fano plane



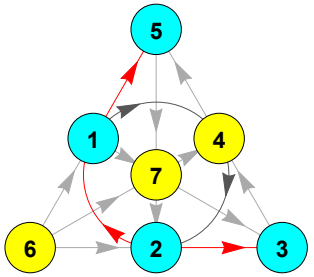
split=5

Fano plane



split=7

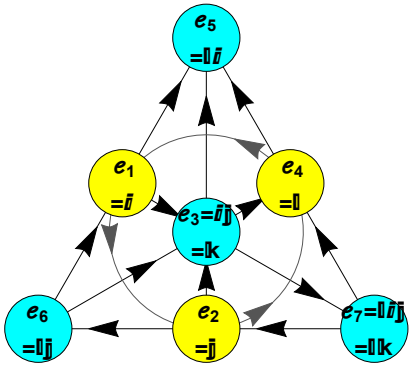
Fano plane



flip=True

{1, 2, 4}{1, 3, 7}{1, 5, 6}{2, 3, 5}{2, 6, 7}{3, 4, 6}{4, 5, 7}

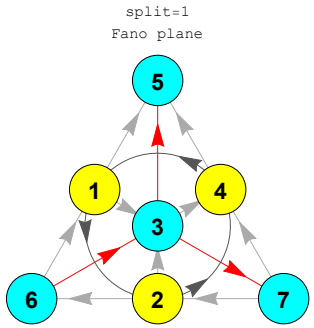
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	e_7	$-e_2$	e_6	$-e_5$	$-e_3$
e_2	e_4	−1	e_5	e_1	$-e_3$	e_7	$-e_6$	
e_3	e_7	$-e_5$	−1	e_6	e_2	$-e_4$	e_1	
e_4	e_2	$-e_1$	$-e_6$	−1	e_7	e_3	$-e_5$	
e_5	$-e_6$	e_3	$-e_2$	$-e_7$	−1	e_1	e_4	
e_6	e_5	$-e_7$	e_4	$-e_3$	$-e_1$	−1	e_2	
e_7	e_3	e_6	$-e_1$	e_5	$-e_4$	$-e_2$	−1	

split=1

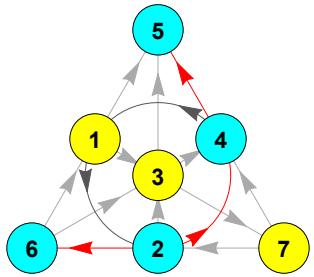
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	7	−2	6	−5	−3
2	−4	−1	5	1	−3	7	−6
3	−7	−5	1	6	−2	4	−1
4	2	−1	−6	−1	7	3	−5
5	−6	3	2	−7	1	−1	−4
6	5	−7	−4	−3	1	1	−2
7	3	6	1	5	4	2	1

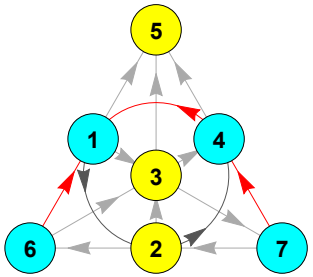
split=2

Fano plane



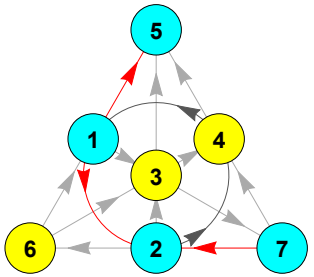
split=4

Fano plane



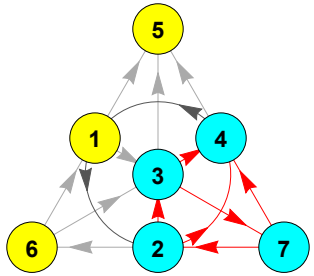
split=6

Fano plane



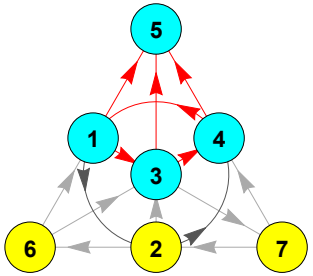
split=3

Fano plane



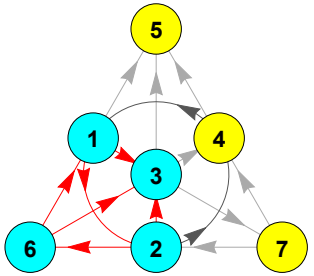
split=5

Fano plane



split=7

Fano plane



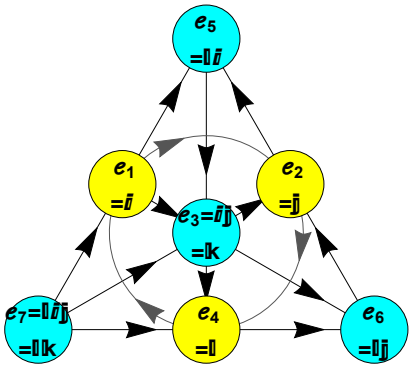
Seq # Symbol 2D/3D Shape Particle Quantum Bits Binary / E8 Coordinates Ele #

225 $d_{\circ_d}^{\rightarrow -1/3}$ 0apggsscc 000010001_2 Bn{ 1 1 1 1 0 0 1 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } $\overline{V}$ 23

flip=False

{1, 2, 4}{1, 3, 6}{1, 5, 7}{2, 7, 3}{2, 5, 6}{3, 4, 5}{4, 6, 7}

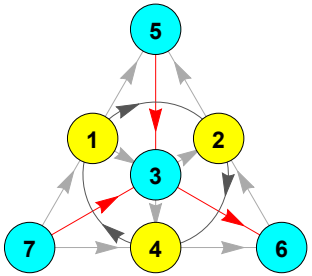
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	e_6	$-e_2$	e_7	$-e_3$	$-e_5$
e_2	e_2	$-e_4$	−1	$-e_7$	e_1	e_6	$-e_5$	e_3
e_3	e_3	$-e_6$	e_7	−1	e_5	$-e_4$	e_1	$-e_2$
e_4	e_4	e_2	$-e_1$	$-e_5$	−1	e_3	e_7	$-e_6$
e_5	e_5	$-e_7$	$-e_6$	e_4	$-e_3$	−1	e_2	e_1
e_6	e_6	e_3	e_5	$-e_1$	$-e_7$	$-e_2$	−1	e_4
e_7	e_7	e_5	$-e_3$	e_2	e_6	$-e_1$	$-e_4$	−1

split=1

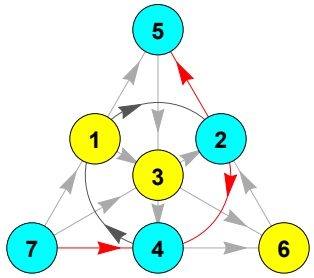
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	6	−2	7	−3	−5
2	−4	−1	−7	1	6	−5	3
3	−6	7	1	5	4	−1	2
4	2	−1	−5	−1	3	7	−6
5	−7	−6	−4	−3	1	−2	−1
6	3	5	1	−7	2	1	−4
7	5	−3	−2	6	1	4	1

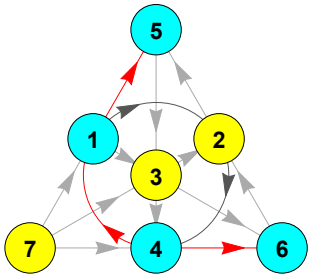
split=2

Fano plane



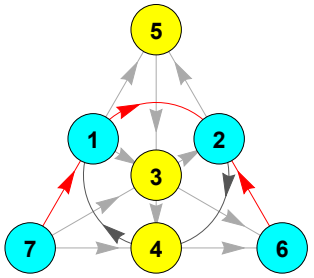
split=4

Fano plane



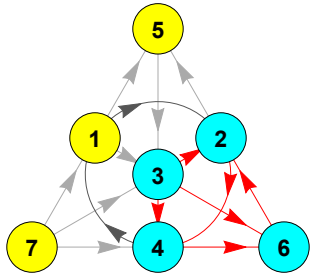
split=6

Fano plane



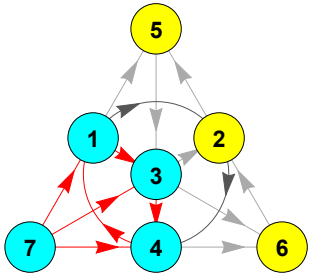
split=3

Fano plane



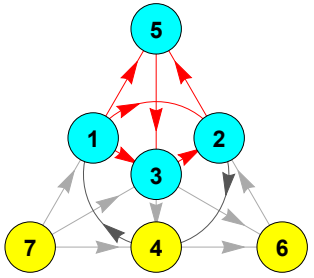
split=5

Fano plane



split=7

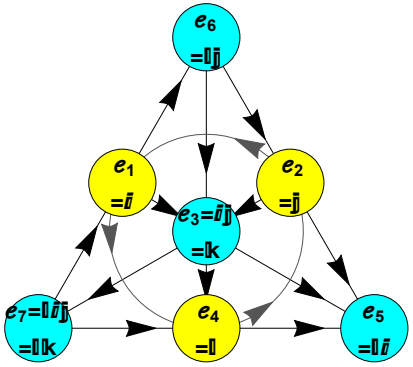
Fano plane



flip=True

{1, 4, 2}{1, 3, 5}{1, 6, 7}{2, 3, 7}{2, 5, 6}{3, 4, 6}{4, 5, 7}

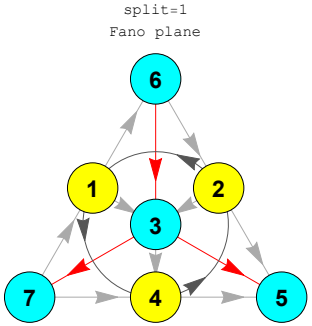
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_4$	e_5	e_2	$-e_3$	e_7	$-e_6$
e_2	e_2	e_4	−1	e_7	$-e_1$	e_6	$-e_5$	$-e_3$
e_3	e_3	$-e_5$	$-e_7$	−1	e_6	e_1	$-e_4$	e_2
e_4	e_4	$-e_2$	e_1	$-e_6$	−1	e_7	e_3	$-e_5$
e_5	e_5	e_3	$-e_6$	$-e_1$	$-e_7$	−1	e_2	e_4
e_6	e_6	$-e_7$	e_5	e_4	$-e_3$	$-e_2$	−1	e_1
e_7	e_7	e_6	e_3	$-e_2$	e_5	$-e_4$	$-e_1$	−1

split=1

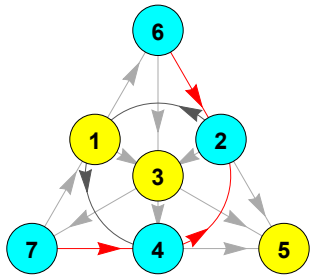
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	5	2	−3	7	−6
2	4	−1	7	−1	6	−5	−3
3	−5	−7	1	6	−1	4	−2
4	−2	1	−6	−1	7	3	−5
5	3	−6	1	−7	1	−2	−4
6	−7	5	−4	−3	2	1	−1
7	6	3	2	5	4	1	1

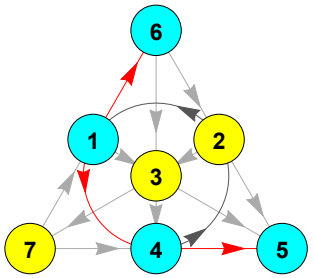
split=2

Fano plane



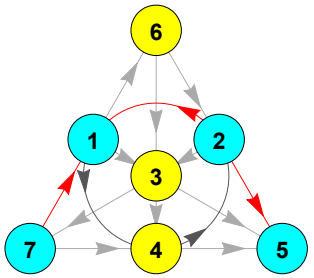
split=4

Fano plane



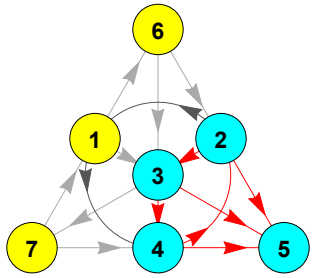
split=6

Fano plane



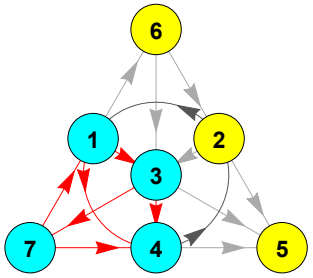
split=3

Fano plane



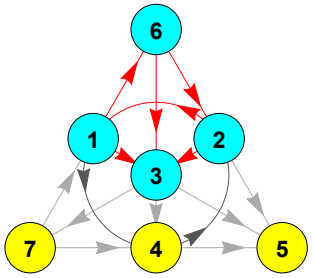
split=5

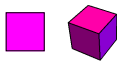
Fano plane



split=7

Fano plane

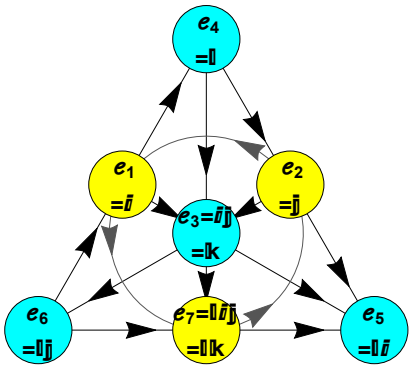


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
226	$b_{\mathbb{R}}^{-1/3\to 2/3}$		0apggsscc 000111111$_2$	Bn{ 1 1 1 0 1 1 1 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Db 105

flip=False

{1, 7, 2}{1, 3, 5}{1, 4, 6}{2, 3, 6}{2, 5, 4}{3, 7, 4}{5, 6, 7}

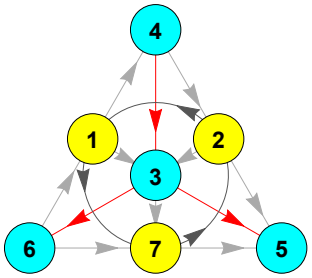
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_5	e_6	$-e_3$	$-e_4$	e_2
e_2	e_7	−1	e_6	$-e_5$	e_4	$-e_3$	$-e_1$
e_3	$-e_5$	$-e_6$	−1	$-e_7$	e_1	e_2	e_4
e_4	$-e_6$	e_5	e_7	−1	$-e_2$	e_1	$-e_3$
e_5	e_3	$-e_4$	$-e_1$	e_2	−1	e_7	$-e_6$
e_6	e_4	e_3	$-e_2$	$-e_1$	$-e_7$	−1	e_5
e_7	$-e_2$	e_1	$-e_4$	e_3	e_6	$-e_5$	−1

split=1

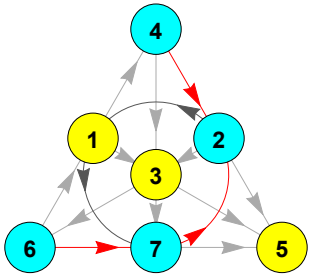
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	5	6	−3	−4	2
2	7	−1	6	−5	4	−3	−1
3	−5	−6	1	7	−1	−2	4
4	−6	5	−7	1	2	−1	−3
5	3	−4	1	−2	1	−7	−6
6	4	3	2	1	7	1	5
7	−2	1	−4	3	6	−5	−1

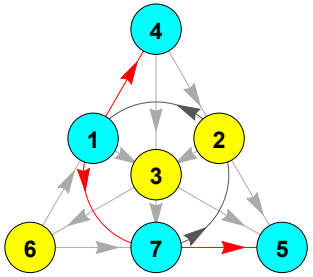
split=2

Fano plane



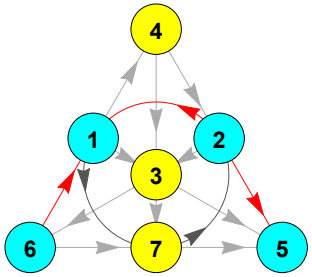
split=4

Fano plane



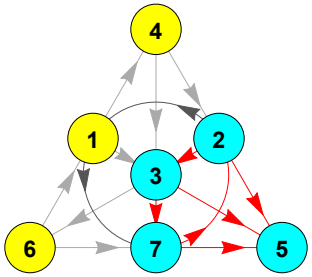
split=6

Fano plane



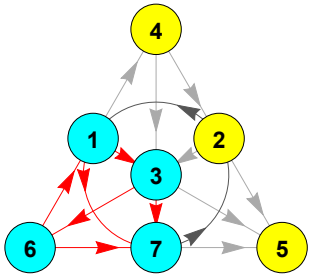
split=3

Fano plane



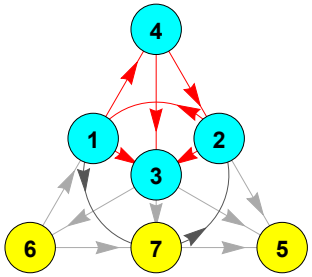
split=5

Fano plane



split=7

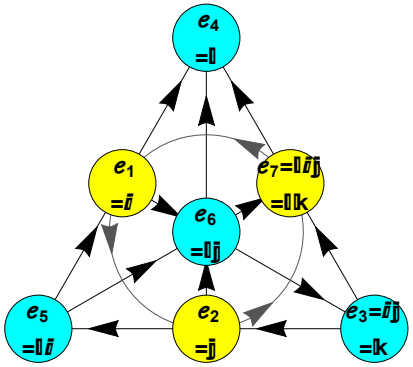
Fano plane



flip=True

{1, 2, 7}{1, 6, 3}{1, 4, 5}{2, 5, 3}{2, 6, 4}{3, 7, 4}{5, 6, 7}

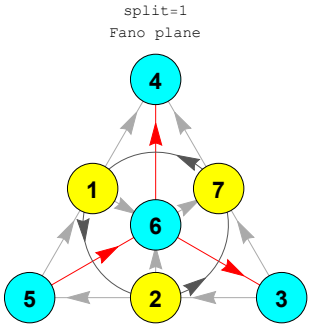
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_6$	e_5	$-e_4$	e_3	$-e_2$
e_2	$-e_7$	−1	$-e_5$	$-e_6$	e_3	e_4	e_1
e_3	e_6	e_5	−1	$-e_7$	$-e_2$	$-e_1$	e_4
e_4	$-e_5$	e_6	e_7	−1	e_1	$-e_2$	$-e_3$
e_5	e_4	$-e_3$	e_2	$-e_1$	−1	e_7	$-e_6$
e_6	$-e_3$	$-e_4$	e_1	e_2	$-e_7$	−1	e_5
e_7	e_2	$-e_1$	$-e_4$	e_3	e_6	$-e_5$	−1

split=1

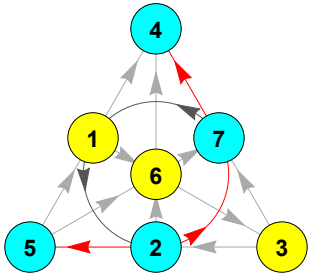
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−6	5	−4	3	−2
2	−7	−1	−5	−6	3	4	1
3	6	5	1	7	2	1	4
4	−5	6	−7	1	−1	2	−3
5	4	−3	−2	1	1	−7	−6
6	−3	−4	−1	−2	7	1	5
7	2	−1	−4	3	6	−5	−1

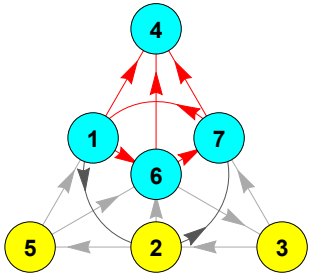
split=2

Fano plane



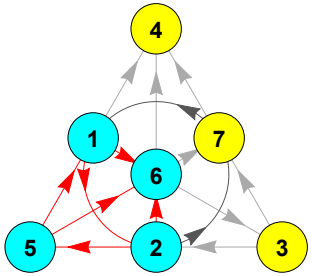
split=4

Fano plane



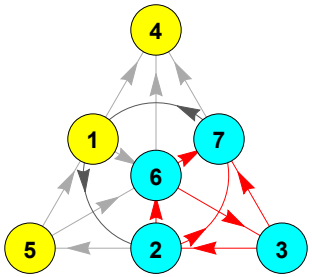
split=6

Fano plane



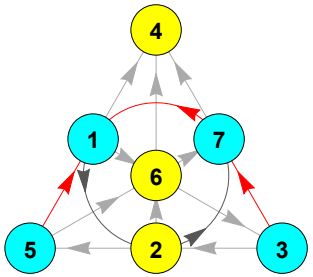
split=3

Fano plane



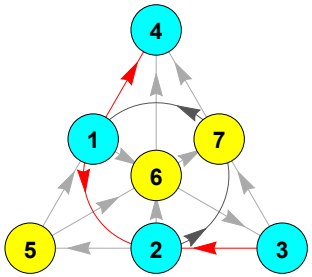
split=5

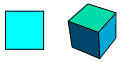
Fano plane



split=7

Fano plane

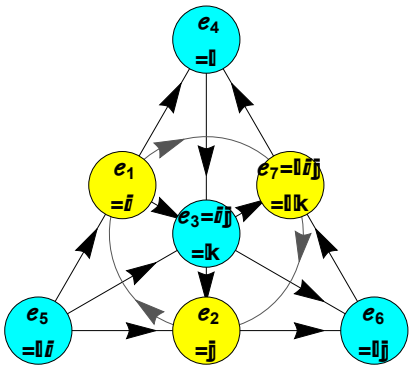


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
227	$\underset{\text{Cm}}{\text{b}}^{\to 2/3}_{\mathbb{R}}$		0apggsscc 000111110_2	Bn{ 1 1 1 0 1 1 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{Mn}}$ 25

flip=False

{1, 7, 2}{1, 3, 6}{1, 4, 5}{2, 4, 3}{2, 6, 5}{3, 7, 5}{4, 6, 7}

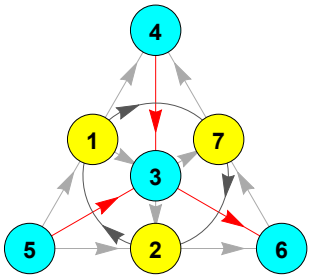
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_6	e_5	$-e_4$	$-e_3$	e_2
e_2	e_7	−1	$-e_4$	e_3	$-e_6$	e_5	$-e_1$
e_3	$-e_6$	e_4	−1	$-e_2$	$-e_7$	e_1	e_5
e_4	$-e_5$	$-e_3$	e_2	−1	e_1	e_7	$-e_6$
e_5	e_4	e_6	e_7	$-e_1$	−1	$-e_2$	$-e_3$
e_6	e_3	$-e_5$	$-e_1$	$-e_7$	e_2	−1	e_4
e_7	$-e_2$	e_1	$-e_5$	e_6	e_3	$-e_4$	−1

split=1

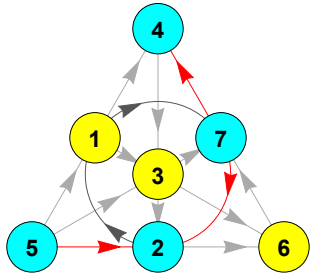
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	6	5	−4	−3	2
2	7	−1	−4	3	−6	5	−1
3	−6	4	1	2	7	−1	5
4	−5	−3	−2	1	−1	−7	−6
5	4	6	−7	1	1	2	−3
6	3	−5	1	7	−2	1	4
7	−2	1	−5	6	3	−4	−1

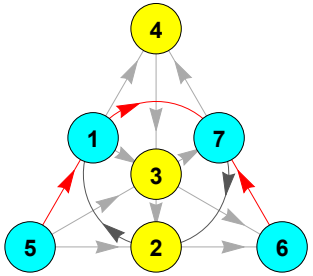
split=2

Fano plane



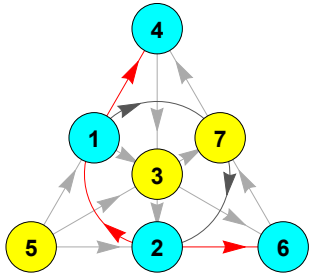
split=4

Fano plane



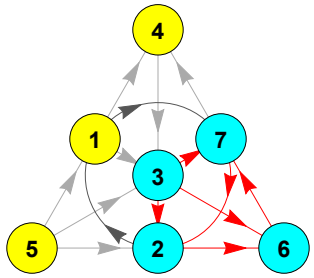
split=6

Fano plane



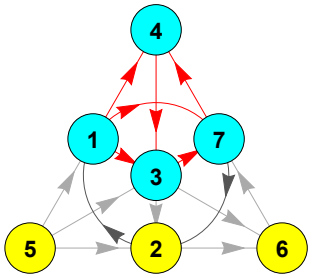
split=3

Fano plane



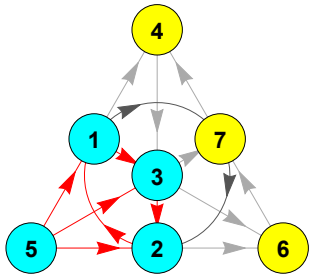
split=5

Fano plane



split=7

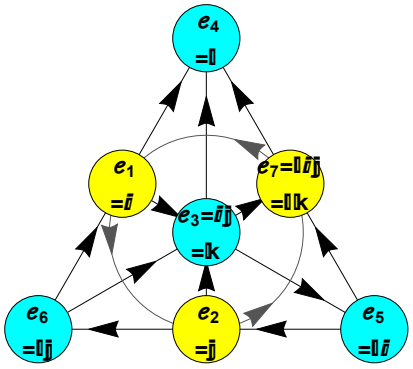
Fano plane



flip=True

{1, 2, 7}{1, 3, 5}{1, 4, 6}{2, 3, 4}{2, 6, 5}{3, 7, 6}{4, 5, 7}

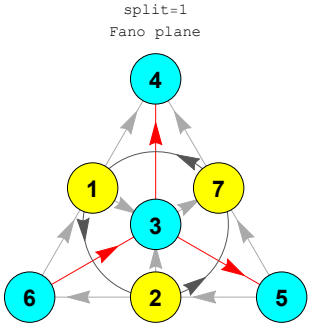
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_5	e_6	$-e_3$	$-e_4$	$-e_2$
e_2	$-e_7$	−1	e_4	$-e_3$	$-e_6$	e_5	e_1
e_3	$-e_5$	$-e_4$	−1	e_2	e_1	$-e_7$	e_6
e_4	$-e_6$	e_3	$-e_2$	−1	e_7	e_1	$-e_5$
e_5	e_3	e_6	$-e_1$	$-e_7$	−1	$-e_2$	e_4
e_6	e_4	$-e_5$	e_7	$-e_1$	e_2	−1	$-e_3$
e_7	e_2	$-e_1$	$-e_6$	e_5	$-e_4$	e_3	−1

split=1

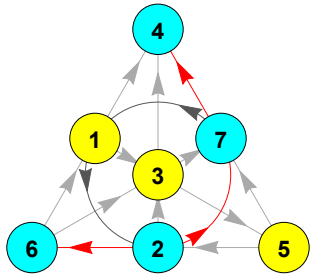
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	5	6	−3	−4	−2
2	−7	−1	4	−3	−6	5	1
3	−5	−4	1	−2	−1	7	6
4	−6	3	2	1	−7	−1	−5
5	3	6	1	7	1	2	4
6	4	−5	−7	1	−2	1	−3
7	2	−1	−6	5	−4	3	−1

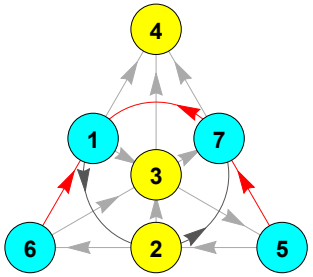
split=2

Fano plane



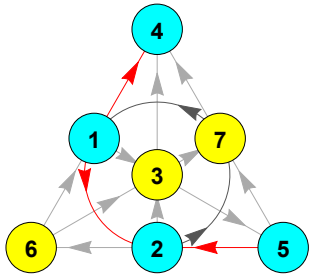
split=4

Fano plane



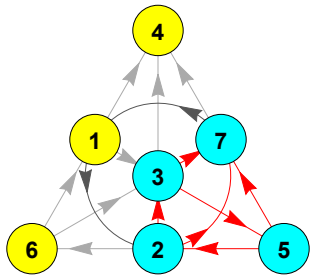
split=6

Fano plane



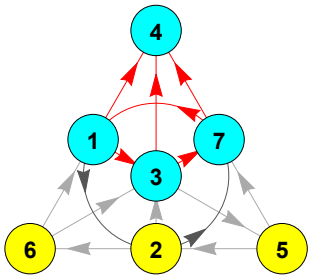
split=3

Fano plane



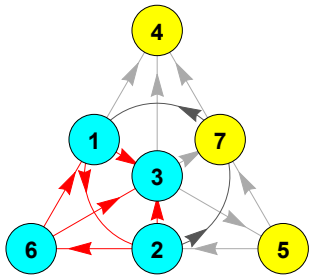
split=5

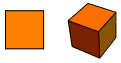
Fano plane



split=7

Fano plane

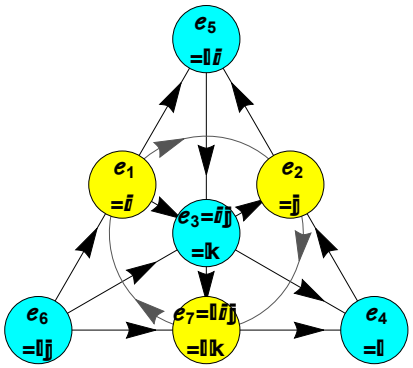


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits	Binary / E8 Coordinates	Ele #
228	$\underset{0_m}{b}^{\to 2/3}_{R}$		0apggsscc 000111101_2	Bn{ 1 1 1 0 1 0 1 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\overline{Ga}}$ 31

flip=False

{1, 2, 7}{1, 3, 4}{1, 5, 6}{2, 6, 3}{2, 5, 4}{3, 7, 5}{4, 6, 7}

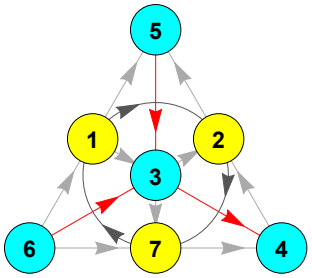
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_4	$-e_3$	e_6	$-e_5$	$-e_2$
e_2	$-e_7$	−1	$-e_6$	$-e_5$	e_4	e_3	e_1
e_3	$-e_4$	e_6	−1	e_1	$-e_7$	$-e_2$	e_5
e_4	e_3	e_5	$-e_1$	−1	$-e_2$	e_7	$-e_6$
e_5	$-e_6$	$-e_4$	e_7	e_2	−1	e_1	$-e_3$
e_6	e_5	$-e_3$	e_2	$-e_7$	$-e_1$	−1	e_4
e_7	e_2	$-e_1$	$-e_5$	e_6	e_3	$-e_4$	−1

split=1

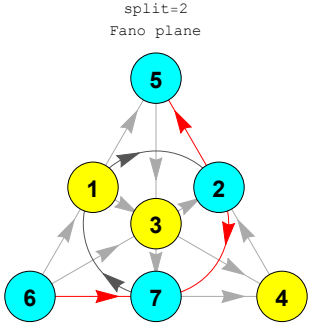
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	4	−3	6	−5	−2
2	−7	−1	−6	−5	4	3	1
3	−4	6	1	−1	7	2	5
4	3	5	1	1	2	−7	−6
5	−6	−4	−7	−2	1	−1	−3
6	5	−3	−2	7	1	1	4
7	2	−1	−5	6	3	−4	−1

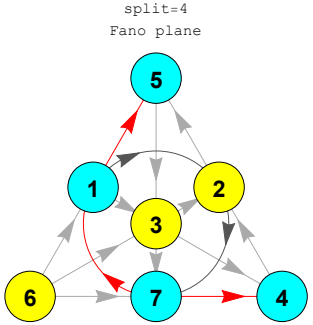
split=2

Fano plane



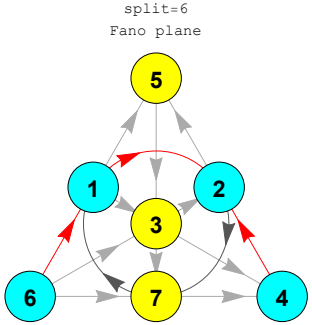
split=4

Fano plane



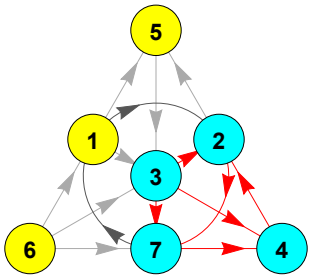
split=6

Fano plane



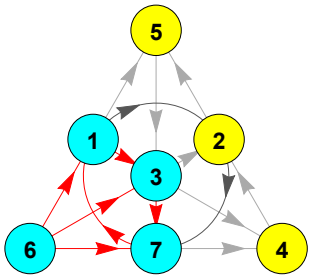
split=3

Fano plane



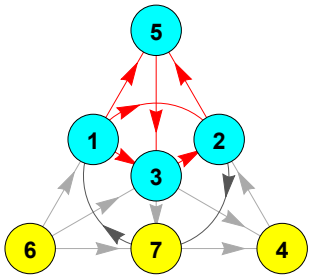
split=5

Fano plane



split=7

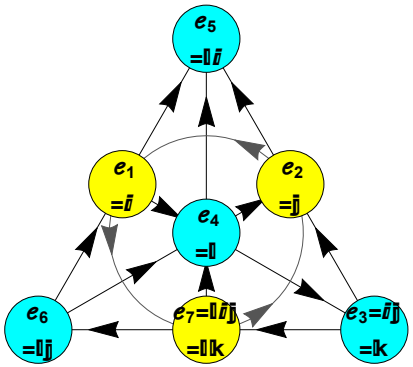
Fano plane



flip=True

{1, 7, 2}{1, 4, 3}{1, 5, 6}{2, 5, 3}{2, 6, 4}{3, 7, 6}{4, 5, 7}

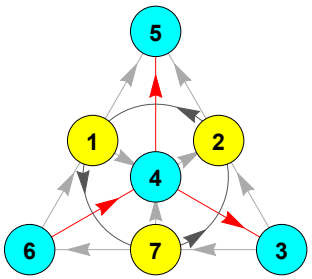
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_4$	e_3	e_6	$-e_5$	e_2
e_2	e_7	−1	$-e_5$	$-e_6$	e_3	e_4	$-e_1$
e_3	e_4	e_5	−1	$-e_1$	$-e_2$	$-e_7$	e_6
e_4	$-e_3$	e_6	e_1	−1	e_7	$-e_2$	$-e_5$
e_5	$-e_6$	$-e_3$	e_2	$-e_7$	−1	e_1	e_4
e_6	e_5	$-e_4$	e_7	e_2	$-e_1$	−1	$-e_3$
e_7	$-e_2$	e_1	$-e_6$	e_5	$-e_4$	e_3	−1

split=1

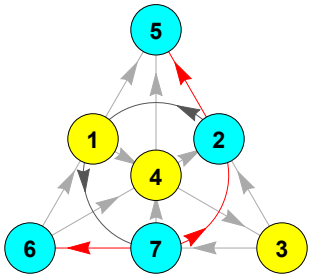
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−4	3	6	−5	2
2	7	−1	−5	−6	3	4	−1
3	4	5	1	1	2	7	6
4	−3	6	−1	1	−7	2	−5
5	−6	−3	−2	7	1	−1	4
6	5	−4	−7	−2	1	1	−3
7	−2	1	−6	5	−4	3	−1

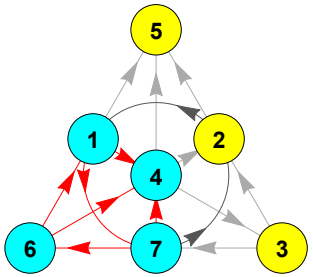
split=2

Fano plane



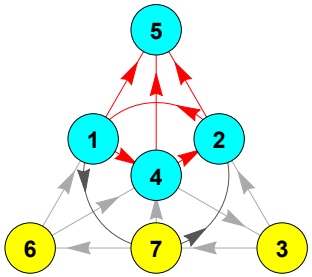
split=4

Fano plane



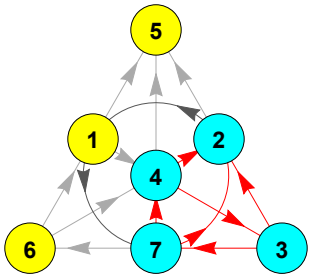
split=6

Fano plane



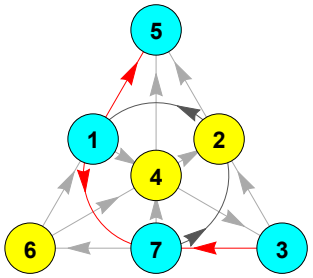
split=3

Fano plane



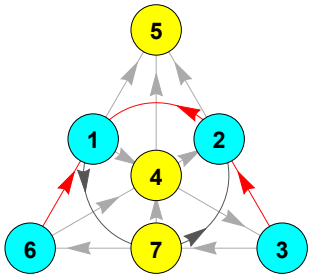
split=5

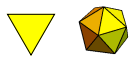
Fano plane



split=7

Fano plane

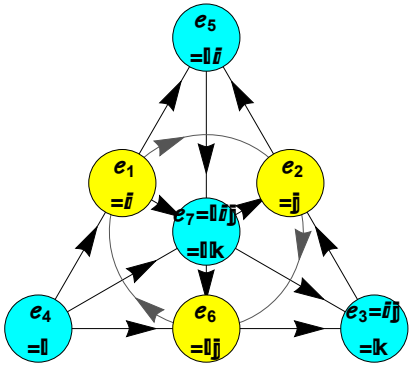


Seq #	Symbol	2D/3D Shape	Particle / Quantum Bits		Binary / E8 Coordinates								Ele #
229	$\frac{\Gamma}{\gamma_m}^{+}_{\mu}$		0apggsscc	Bn{	1	1	1	0	0	1	1	1 }	$\overline{Rb}$
			010111100_2	E8{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ }	37

flip=False

{1, 2, 6}{1, 7, 3}{1, 5, 4}{2, 5, 3}{2, 4, 7}{3, 4, 6}{5, 7, 6}

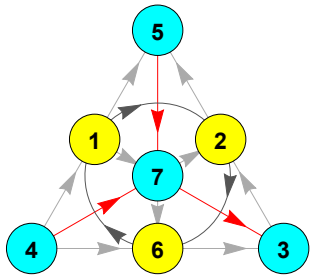
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	e_6	$-e_7$	$-e_5$	e_4	$-e_2$	e_3
e_2	$-e_6$	-1	$-e_5$	e_7	e_3	e_1	$-e_4$
e_3	e_7	e_5	-1	e_6	$-e_2$	$-e_4$	$-e_1$
e_4	e_5	$-e_7$	$-e_6$	-1	$-e_1$	e_3	e_2
e_5	$-e_4$	$-e_3$	e_2	e_1	-1	$-e_7$	e_6
e_6	e_2	$-e_1$	e_4	$-e_3$	e_7	-1	$-e_5$
e_7	$-e_3$	e_4	e_1	$-e_2$	$-e_6$	e_5	-1

split=1

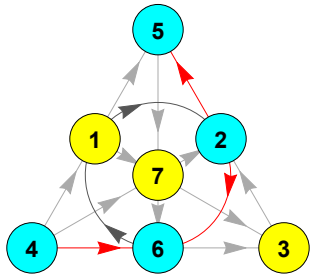
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−7	−5	4	−2	3
2	−6	−1	−5	7	3	1	−4
3	7	5	1	−6	2	−4	1
4	5	−7	6	1	1	3	−2
5	−4	−3	−2	−1	1	−7	−6
6	2	−1	4	−3	7	−1	−5
7	−3	4	−1	2	6	5	1

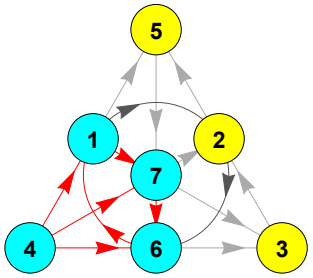
split=2

Fano plane



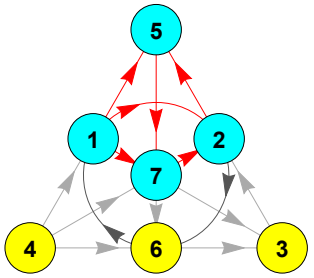
split=4

Fano plane



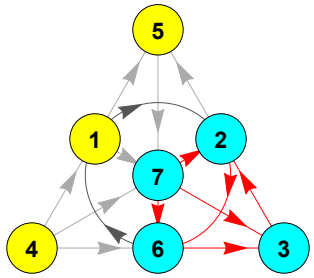
split=6

Fano plane



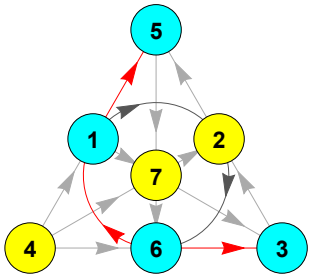
split=3

Fano plane



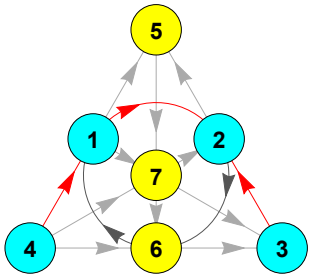
split=5

Fano plane



split=7

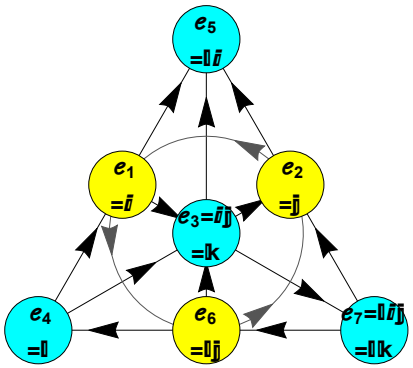
Fano plane



flip=True

{1, 6, 2}{1, 3, 7}{1, 5, 4}{2, 4, 3}{2, 5, 7}{3, 5, 6}{4, 7, 6}

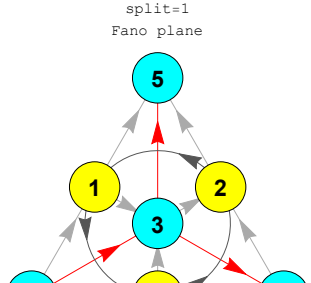
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_6$	e_7	$-e_5$	e_4	e_2	$-e_3$
e_2	e_6	-1	$-e_4$	e_3	e_7	$-e_1$	$-e_5$
e_3	$-e_7$	e_4	-1	$-e_2$	e_6	$-e_5$	e_1
e_4	e_5	$-e_3$	e_2	-1	$-e_1$	$-e_7$	e_6
e_5	$-e_4$	$-e_7$	$-e_6$	e_1	-1	e_3	e_2
e_6	$-e_2$	e_1	e_5	e_7	$-e_3$	-1	$-e_4$
e_7	e_3	e_5	$-e_1$	$-e_6$	$-e_2$	e_4	-1

split=1

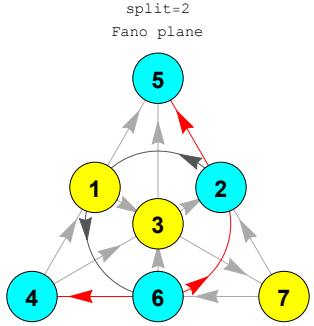
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	7	−5	4	2	−3
2	6	−1	−4	3	7	−1	−5
3	−7	4	1	2	−6	−5	−1
4	5	−3	−2	1	1	−7	−6
5	−4	−7	6	−1	1	3	−2
6	−2	1	5	7	−3	−1	−4
7	3	5	1	6	2	4	1

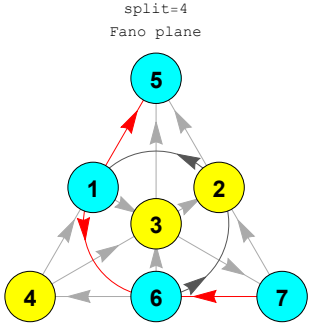
split=2

Fano plane



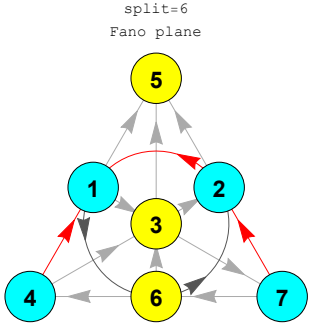
split=4

Fano plane



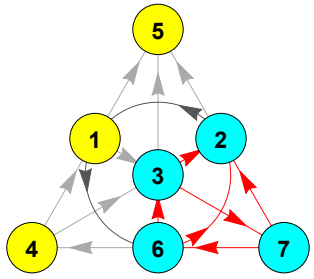
split=6

Fano plane



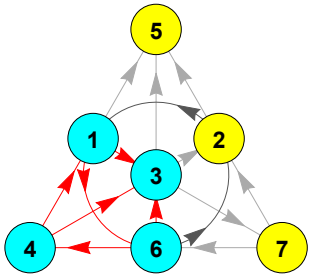
split=3

Fano plane



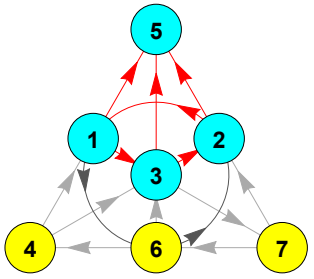
split=5

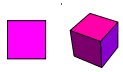
Fano plane



split=7

Fano plane

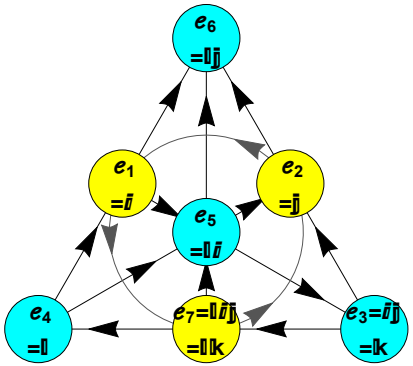


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
230	$b_{m_m}^{-1/3}$		0apggsscc 000111011_2	Bn{ E8{	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	No 102

flip=False

{1, 7, 2}{1, 5, 3}{1, 6, 4}{2, 6, 3}{2, 4, 5}{3, 7, 4}{5, 6, 7}

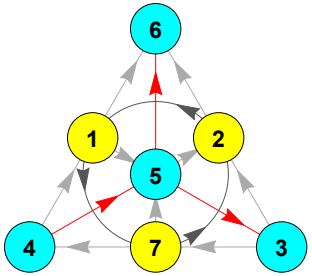
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_5$	$-e_6$	e_3	e_4	e_2
e_2	e_7	−1	$-e_6$	e_5	$-e_4$	e_3	$-e_1$
e_3	e_5	e_6	−1	$-e_7$	$-e_1$	$-e_2$	e_4
e_4	e_6	$-e_5$	e_7	−1	e_2	$-e_1$	$-e_3$
e_5	$-e_3$	e_4	e_1	$-e_2$	−1	e_7	$-e_6$
e_6	$-e_4$	$-e_3$	e_2	e_1	$-e_7$	−1	e_5
e_7	$-e_2$	e_1	$-e_4$	e_3	e_6	$-e_5$	−1

split=1

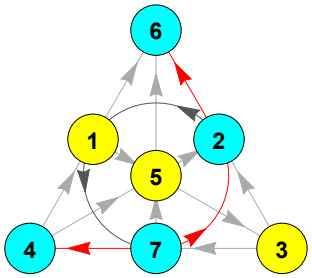
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−5	−6	3	4	2
2	7	−1	−6	5	−4	3	−1
3	5	6	1	7	1	2	4
4	6	−5	−7	1	−2	1	−3
5	−3	4	−1	2	1	−7	−6
6	−4	−3	−2	−1	7	1	5
7	−2	1	−4	3	6	−5	−1

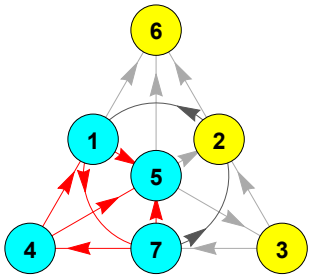
split=2

Fano plane



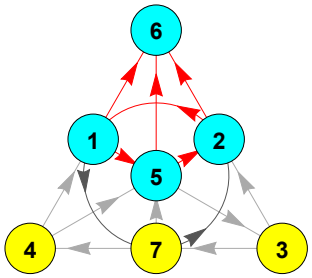
split=4

Fano plane



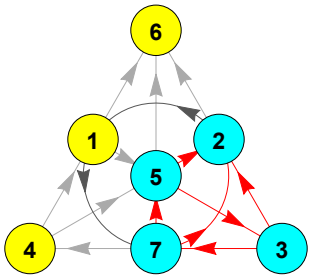
split=6

Fano plane



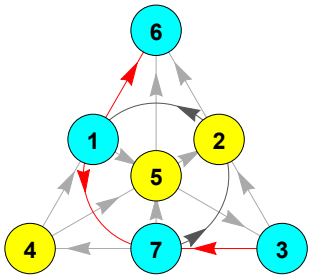
split=3

Fano plane



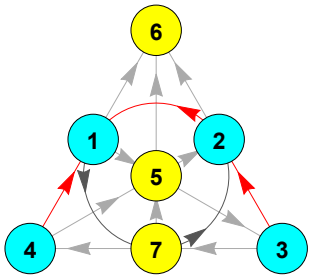
split=5

Fano plane



split=7

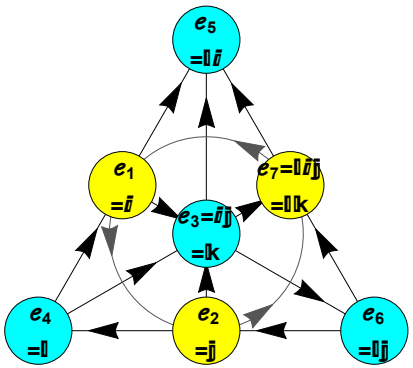
Fano plane



flip=True

{1, 2, 7}{1, 3, 6}{1, 5, 4}{2, 3, 5}{2, 4, 6}{3, 7, 4}{5, 6, 7}

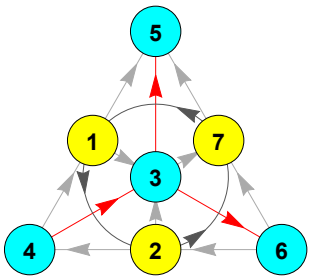
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_6	$-e_5$	e_4	$-e_3$	$-e_2$
e_2	$-e_7$	−1	e_5	e_6	$-e_3$	$-e_4$	e_1
e_3	$-e_6$	$-e_5$	−1	$-e_7$	e_2	e_1	e_4
e_4	e_5	$-e_6$	e_7	−1	$-e_1$	e_2	$-e_3$
e_5	$-e_4$	e_3	$-e_2$	e_1	−1	e_7	$-e_6$
e_6	e_3	e_4	$-e_1$	$-e_2$	$-e_7$	−1	e_5
e_7	e_2	$-e_1$	$-e_4$	e_3	e_6	$-e_5$	−1

split=1

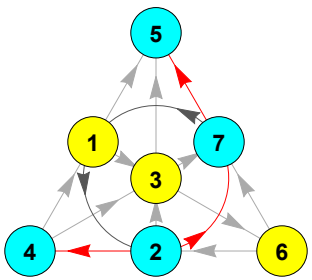
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	6	−5	4	−3	−2
2	−7	−1	5	6	−3	−4	1
3	−6	−5	1	7	−2	−1	4
4	5	−6	−7	1	1	−2	−3
5	−4	3	2	−1	1	−7	−6
6	3	4	1	2	7	1	5
7	2	−1	−4	3	6	−5	−1

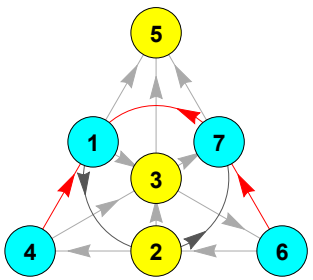
split=2

Fano plane



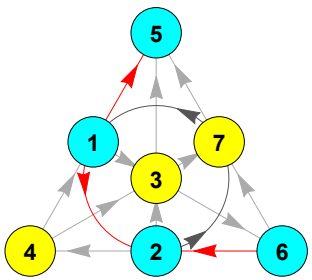
split=4

Fano plane



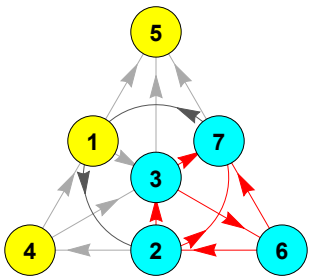
split=6

Fano plane



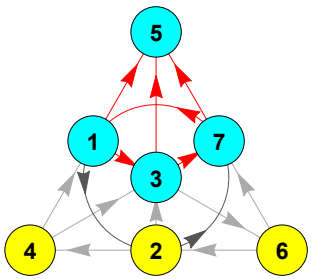
split=3

Fano plane



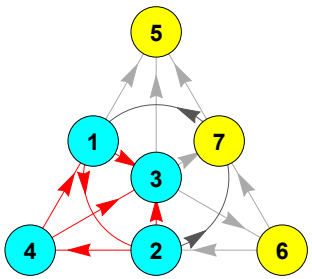
split=5

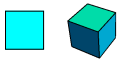
Fano plane



split=7

Fano plane

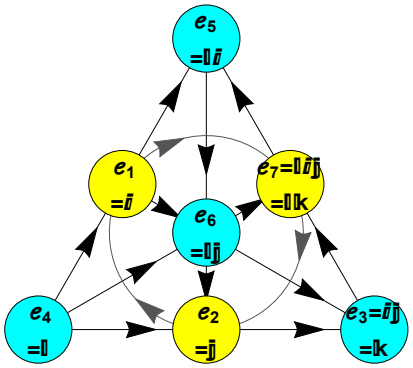


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
231	$b_{Cm}^{\rightarrow -1/3}$		0apggsscc 000111010_2	Bn{ 1 1 0 1 1 1 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\overline{As}}$ 33

flip=False

{1, 7, 2}{1, 6, 3}{1, 5, 4}{2, 3, 4}{2, 5, 6}{3, 7, 5}{4, 6, 7}

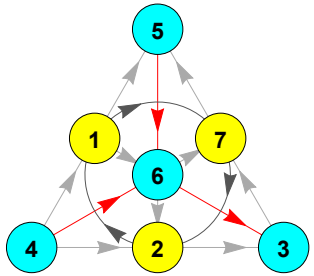
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_6$	$-e_5$	e_4	e_3	e_2
e_2	e_7	−1	e_4	$-e_3$	e_6	$-e_5$	$-e_1$
e_3	e_6	$-e_4$	−1	e_2	$-e_7$	$-e_1$	e_5
e_4	e_5	e_3	$-e_2$	−1	$-e_1$	e_7	$-e_6$
e_5	$-e_4$	$-e_6$	e_7	e_1	−1	e_2	$-e_3$
e_6	$-e_3$	e_5	e_1	$-e_7$	$-e_2$	−1	e_4
e_7	$-e_2$	e_1	$-e_5$	e_6	e_3	$-e_4$	−1

split=1

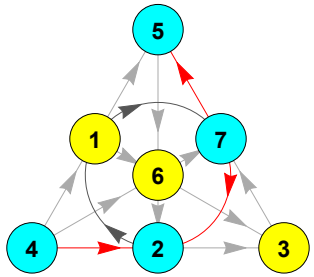
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−6	−5	4	3	2
2	7	−1	4	−3	6	−5	−1
3	6	−4	1	−2	7	1	5
4	5	3	2	1	1	−7	−6
5	−4	−6	−7	−1	1	−2	−3
6	−3	5	−1	7	2	1	4
7	−2	1	−5	6	3	−4	−1

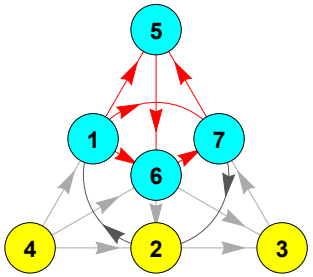
split=2

Fano plane



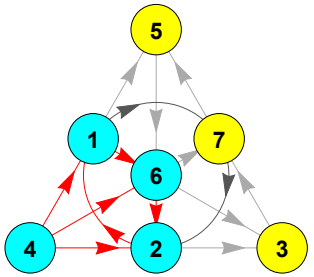
split=4

Fano plane



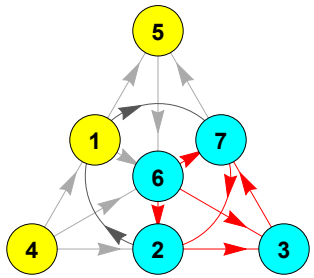
split=6

Fano plane



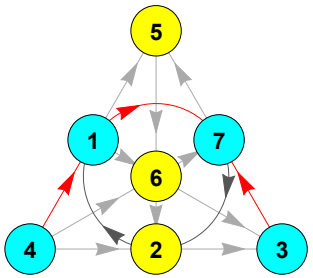
split=3

Fano plane



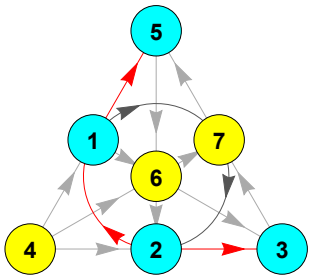
split=5

Fano plane



split=7

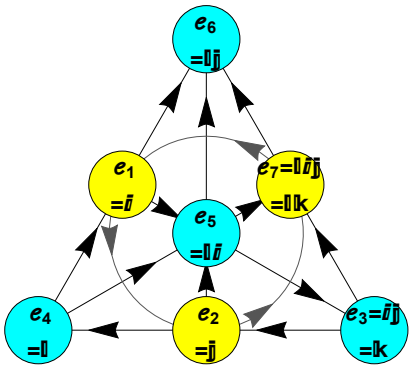
Fano plane



flip=True

{1, 2, 7}{1, 5, 3}{1, 6, 4}{2, 4, 3}{2, 5, 6}{3, 7, 6}{4, 5, 7}

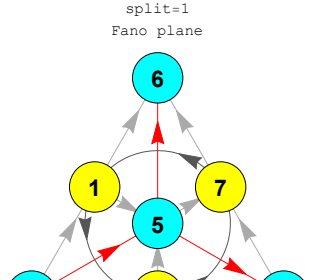
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_5$	$-e_6$	e_3	e_4	$-e_2$
e_2	$-e_7$	−1	$-e_4$	e_3	e_6	$-e_5$	e_1
e_3	e_5	e_4	−1	$-e_2$	$-e_1$	$-e_7$	e_6
e_4	e_6	$-e_3$	e_2	−1	e_7	$-e_1$	$-e_5$
e_5	$-e_3$	$-e_6$	e_1	$-e_7$	−1	e_2	e_4
e_6	$-e_4$	e_5	e_7	e_1	$-e_2$	−1	$-e_3$
e_7	e_2	$-e_1$	$-e_6$	e_5	$-e_4$	e_3	−1

split=1

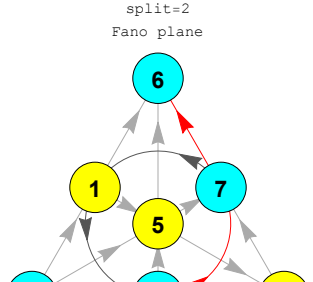
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−5	−6	3	4	−2
2	−7	−1	−4	3	6	−5	1
3	5	4	1	2	1	7	6
4	6	−3	−2	1	−7	1	−5
5	−3	−6	−1	7	1	−2	4
6	−4	5	−7	−1	2	1	−3
7	2	−1	−6	5	−4	3	−1

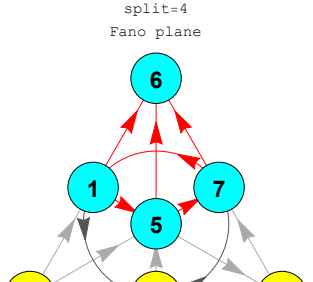
split=2

Fano plane



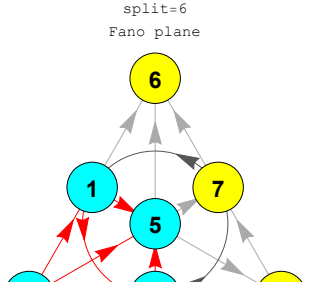
split=4

Fano plane



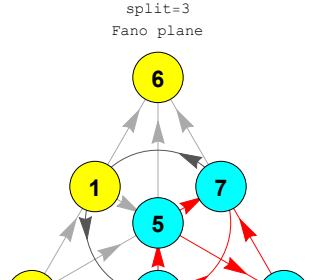
split=6

Fano plane



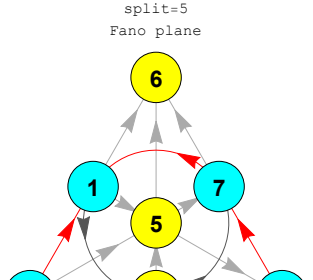
split=3

Fano plane



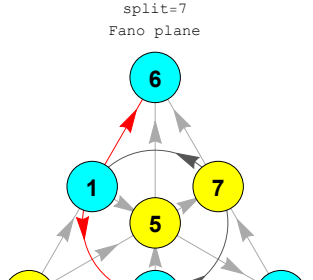
split=5

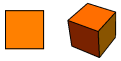
Fano plane



split=7

Fano plane

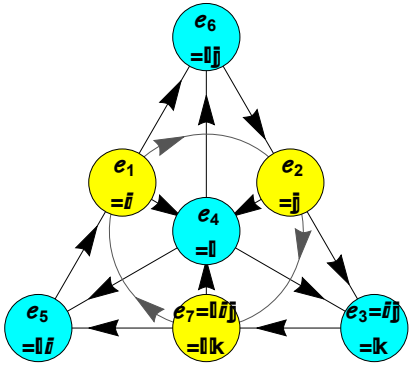


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
232	$\underset{\circ_m}{b}\ \vec{L}^{-1/3}$		0apggsscc 0001110011_2	Bn{ 1 1 0 1 1 0 1 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Y}$ 39

flip=False

{1, 2, 7}{1, 4, 3}{1, 6, 5}{2, 3, 6}{2, 4, 5}{3, 7, 5}{4, 6, 7}

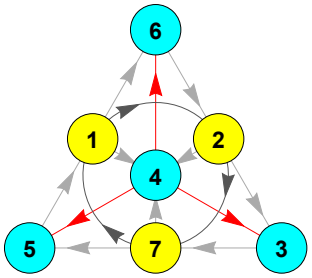
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_4$	e_3	$-e_6$	e_5	$-e_2$
e_2	$-e_7$	−1	e_6	e_5	$-e_4$	$-e_3$	e_1
e_3	e_4	$-e_6$	−1	$-e_1$	$-e_7$	e_2	e_5
e_4	$-e_3$	$-e_5$	e_1	−1	e_2	e_7	$-e_6$
e_5	e_6	e_4	e_7	$-e_2$	−1	$-e_1$	$-e_3$
e_6	$-e_5$	e_3	$-e_2$	$-e_7$	e_1	−1	e_4
e_7	e_2	$-e_1$	$-e_5$	e_6	e_3	$-e_4$	−1

split=1

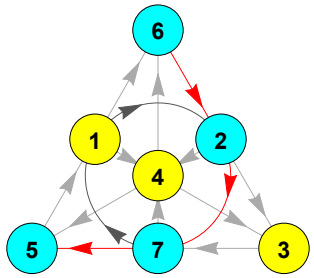
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−4	3	−6	5	−2
2	−7	−1	6	5	−4	−3	1
3	4	−6	1	1	7	−2	5
4	−3	−5	−1	1	−2	−7	−6
5	6	4	−7	2	1	1	−3
6	−5	3	2	7	−1	1	4
7	2	−1	−5	6	3	−4	−1

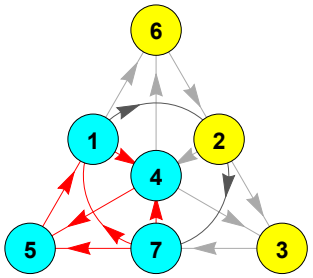
split=2

Fano plane



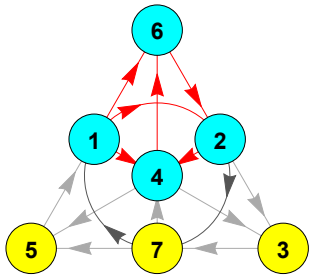
split=4

Fano plane



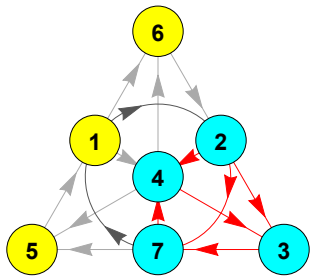
split=6

Fano plane



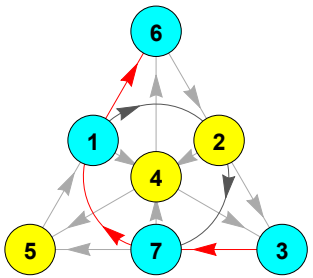
split=3

Fano plane



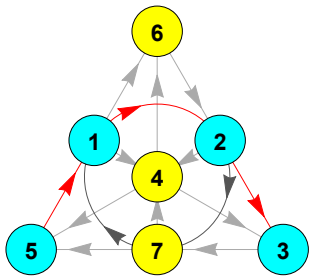
split=5

Fano plane



split=7

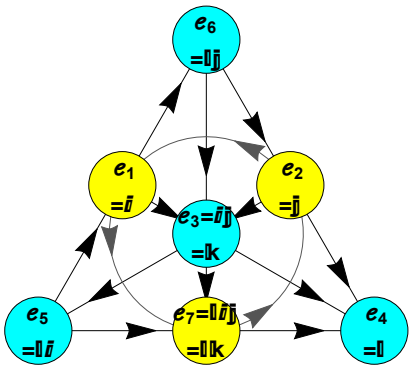
Fano plane



flip=True

{1, 7, 2}{1, 3, 4}{1, 6, 5}{2, 3, 5}{2, 4, 6}{3, 7, 6}{4, 5, 7}

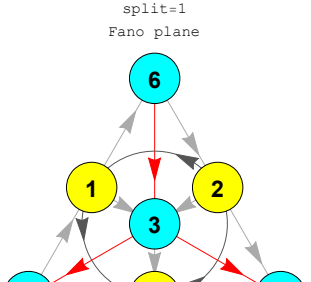
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_4	$-e_3$	$-e_6$	e_5	e_2
e_2	e_7	−1	e_5	e_6	$-e_3$	$-e_4$	$-e_1$
e_3	$-e_4$	$-e_5$	−1	e_1	e_2	$-e_7$	e_6
e_4	e_3	$-e_6$	$-e_1$	−1	e_7	e_2	$-e_5$
e_5	e_6	e_3	$-e_2$	$-e_7$	−1	$-e_1$	e_4
e_6	$-e_5$	e_4	e_7	$-e_2$	e_1	−1	$-e_3$
e_7	$-e_2$	e_1	$-e_6$	e_5	$-e_4$	e_3	−1

split=1

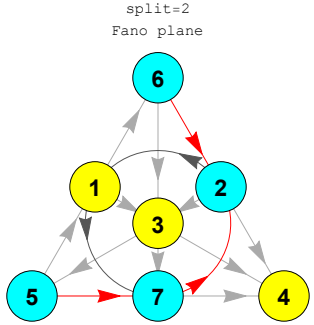
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	4	−3	−6	5	2
2	7	−1	5	6	−3	−4	−1
3	−4	−5	1	−1	−2	7	6
4	3	−6	1	1	−7	−2	−5
5	6	3	2	7	1	1	4
6	−5	4	−7	2	−1	1	−3
7	−2	1	−6	5	−4	3	−1

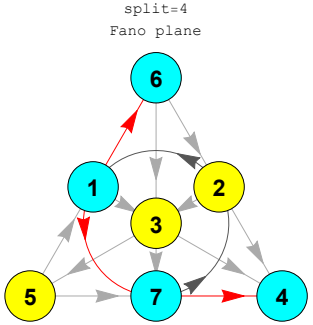
split=2

Fano plane



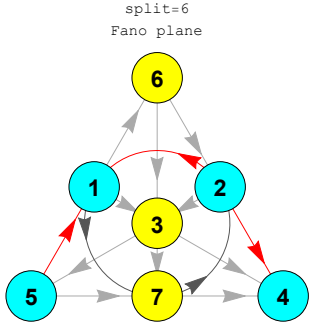
split=4

Fano plane



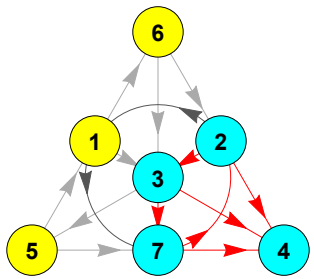
split=6

Fano plane



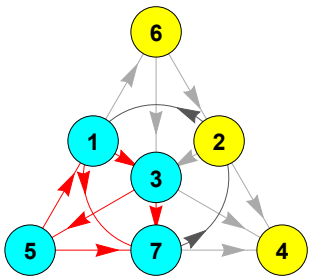
split=3

Fano plane



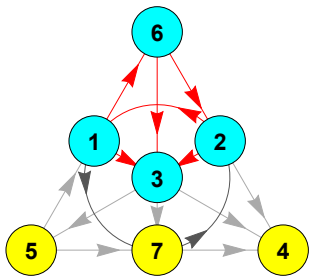
split=5

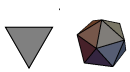
Fano plane



split=7

Fano plane

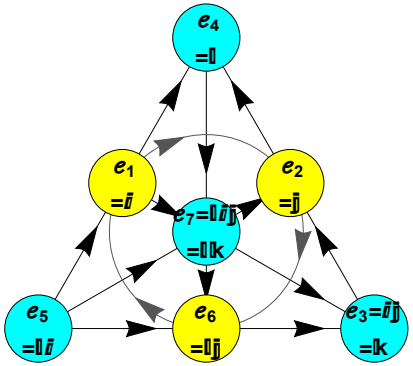


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
233	$\overline{V_{\tau}}^{0}_{Wm}$		0apggsscc 011111100_2	Bn{ 1 1 0 1 0 1 1 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Rh}$ 45

flip=False

{1, 2, 6}{1, 7, 3}{1, 4, 5}{2, 4, 3}{2, 5, 7}{3, 5, 6}{4, 7, 6}

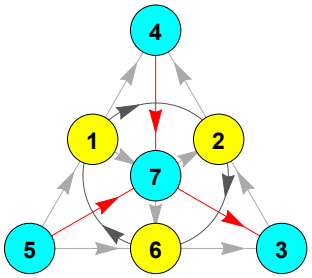
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	$-e_7$	e_5	$-e_4$	$-e_2$	e_3
e_2	$-e_6$	−1	$-e_4$	e_3	e_7	e_1	$-e_5$
e_3	e_7	e_4	−1	$-e_2$	e_6	$-e_5$	$-e_1$
e_4	$-e_5$	$-e_3$	e_2	−1	e_1	$-e_7$	e_6
e_5	e_4	$-e_7$	$-e_6$	$-e_1$	−1	e_3	e_2
e_6	e_2	$-e_1$	e_5	e_7	$-e_3$	−1	$-e_4$
e_7	$-e_3$	e_5	e_1	$-e_6$	$-e_2$	e_4	−1

split=1

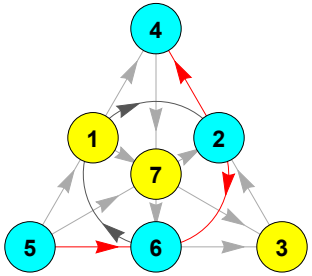
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−7	5	−4	−2	3
2	−6	−1	−4	3	7	1	−5
3	7	4	1	2	−6	−5	1
4	−5	−3	−2	1	−1	−7	−6
5	4	−7	6	1	1	3	−2
6	2	−1	5	7	−3	−1	−4
7	−3	5	−1	6	2	4	1

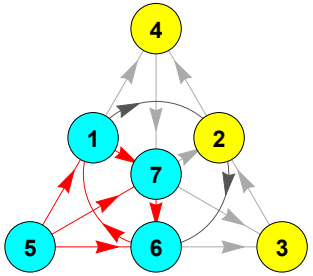
split=2

Fano plane



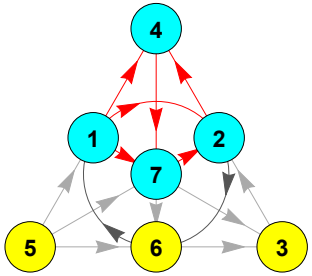
split=4

Fano plane



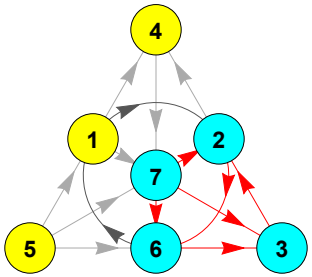
split=6

Fano plane



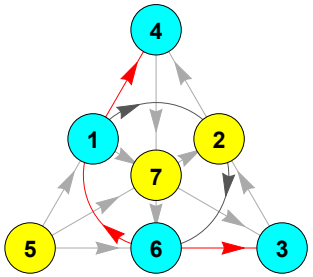
split=3

Fano plane



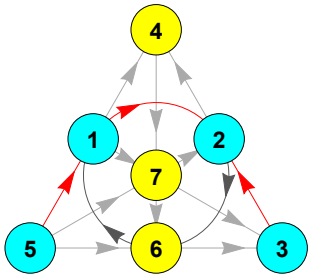
split=5

Fano plane



split=7

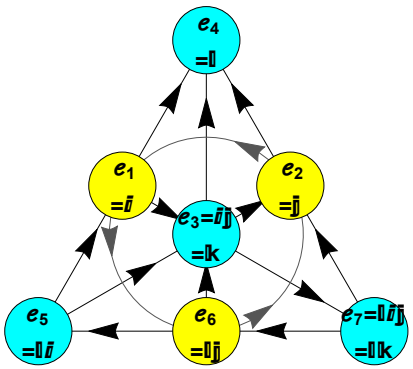
Fano plane



flip=True

{1, 6, 2}{1, 3, 7}{1, 4, 5}{2, 5, 3}{2, 4, 7}{3, 4, 6}{5, 7, 6}

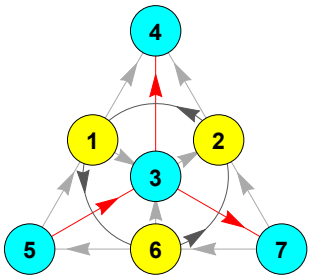
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	e_7	e_5	$-e_4$	e_2	$-e_3$
e_2	e_6	−1	$-e_5$	e_7	e_3	$-e_1$	$-e_4$
e_3	$-e_7$	e_5	−1	e_6	$-e_2$	$-e_4$	e_1
e_4	$-e_5$	$-e_7$	$-e_6$	−1	e_1	e_3	e_2
e_5	e_4	$-e_3$	e_2	$-e_1$	−1	$-e_7$	e_6
e_6	$-e_2$	e_1	e_4	$-e_3$	e_7	−1	$-e_5$
e_7	e_3	e_4	$-e_1$	$-e_2$	$-e_6$	e_5	−1

split=1

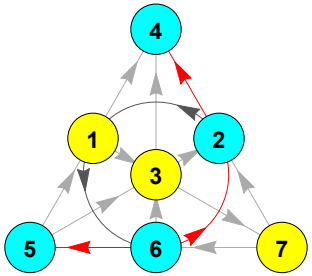
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	7	5	−4	2	−3
2	6	−1	−5	7	3	−1	−4
3	−7	5	1	−6	2	−4	−1
4	−5	−7	6	1	−1	3	−2
5	4	−3	−2	1	1	−7	−6
6	−2	1	4	−3	7	−1	−5
7	3	4	1	2	6	5	1

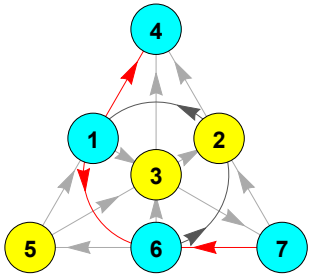
split=2

Fano plane



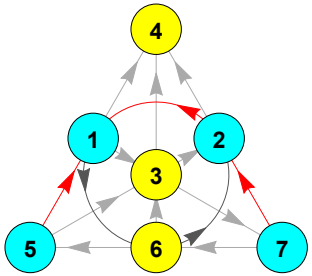
split=4

Fano plane



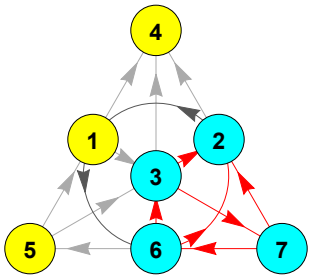
split=6

Fano plane



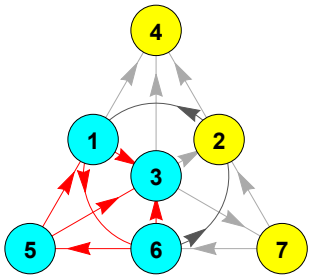
split=3

Fano plane



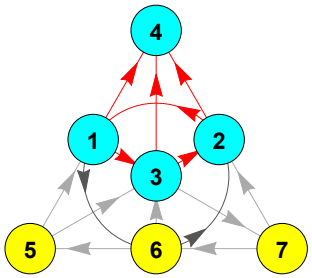
split=5

Fano plane



split=7

Fano plane

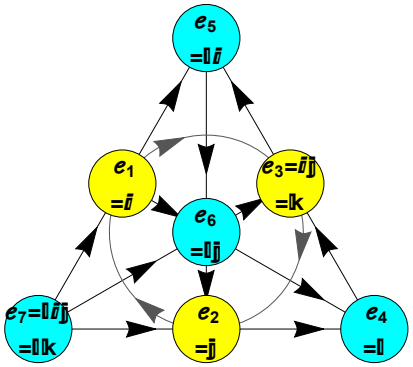


Seq #	Symbol	2D/3D Shape	Particle	Quantum Bits	Binary / E8 Coordinates	Ele #
234	$\overline{e}_{y_1}^{+}$		0apggsscc	010010100_2	Bn{ 1 1 0 0 1 1 1 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{Te}}$ 52

flip=False

{1, 3, 2}{1, 6, 4}{1, 5, 7}{2, 4, 7}{2, 5, 6}{3, 5, 4}{3, 7, 6}

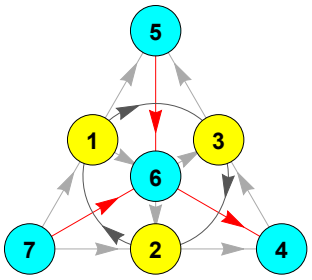
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_3$	e_2	$-e_6$	e_7	e_4	$-e_5$
e_2	e_3	-1	$-e_1$	e_7	e_6	$-e_5$	$-e_4$
e_3	$-e_2$	e_1	-1	$-e_5$	e_4	$-e_7$	e_6
e_4	e_6	$-e_7$	e_5	-1	$-e_3$	$-e_1$	e_2
e_5	$-e_7$	$-e_6$	$-e_4$	e_3	-1	e_2	e_1
e_6	$-e_4$	e_5	e_7	e_1	$-e_2$	-1	$-e_3$
e_7	e_5	e_4	$-e_6$	$-e_2$	$-e_1$	e_3	-1

split=1

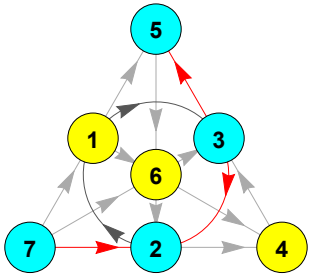
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-3	2	-6	7	4	-5
2	3	-1	-1	7	6	-5	-4
3	-2	1	-1	-5	4	-7	6
4	6	-7	5	1	3	1	-2
5	-7	-6	-4	-3	1	-2	-1
6	-4	5	7	-1	2	1	3
7	5	4	-6	2	1	-3	1

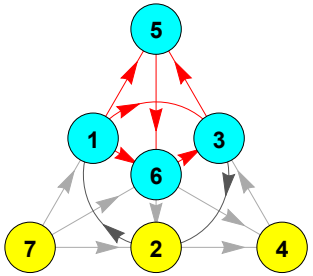
split=2

Fano plane



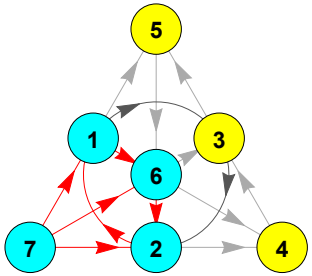
split=4

Fano plane



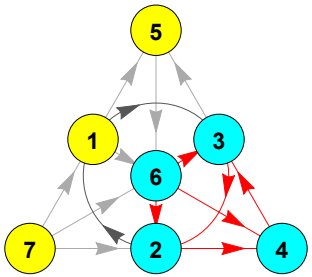
split=6

Fano plane



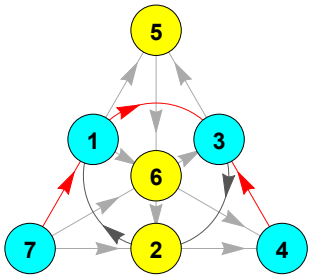
split=3

Fano plane



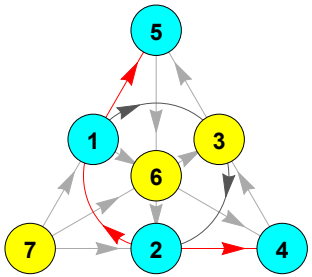
split=5

Fano plane



split=7

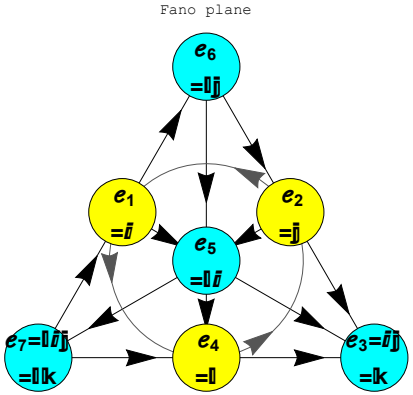
Fano plane



flip=True

{1, 4, 2}{1, 5, 3}{1, 6, 7}{2, 3, 6}{2, 5, 7}{3, 7, 4}{4, 6, 5}

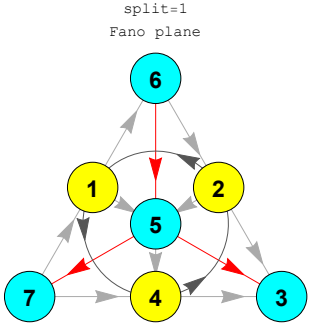
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	-1	$-e_4$	$-e_5$	e_2	e_3	e_7	$-e_6$
e_2	e_4	-1	e_6	$-e_1$	e_7	$-e_3$	$-e_5$
e_3	e_5	$-e_6$	-1	$-e_7$	$-e_1$	e_2	e_4
e_4	$-e_2$	e_1	e_7	-1	$-e_6$	e_5	$-e_3$
e_5	$-e_3$	$-e_7$	e_1	e_6	-1	$-e_4$	e_2
e_6	$-e_7$	e_3	$-e_2$	$-e_5$	e_4	-1	e_1
e_7	e_6	e_5	$-e_4$	e_3	$-e_2$	$-e_1$	-1

split=1

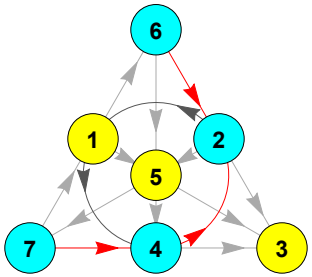
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-4	-5	2	3	7	-6
2	4	-1	6	-1	7	-3	-5
3	5	-6	1	-7	1	-2	-4
4	-2	1	7	-1	-6	5	-3
5	-3	-7	-1	6	1	4	-2
6	-7	3	2	-5	-4	1	-1
7	6	5	4	3	2	1	1

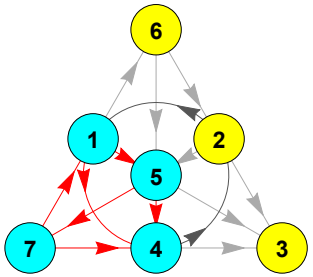
split=2

Fano plane



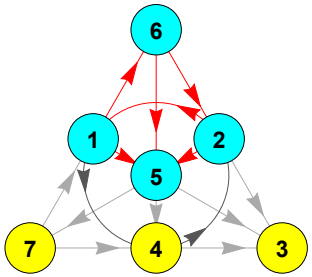
split=4

Fano plane



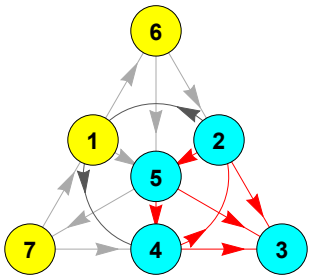
split=6

Fano plane



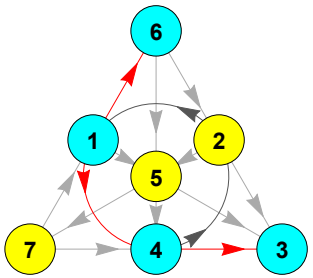
split=3

Fano plane



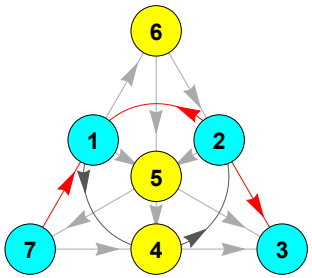
split=5

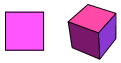
Fano plane



split=7

Fano plane

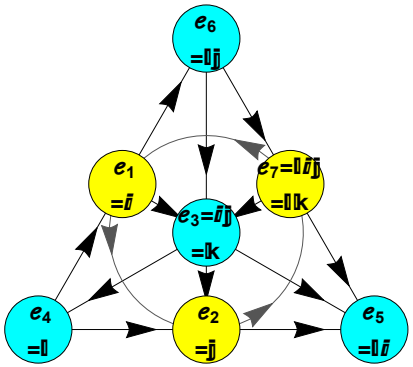


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
235	$b_{m_1}^{-1/3}$		0apggsscc 000110111_2	Bn{ 1 0 1 1 1 1 1 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ }	Cf 98

flip=False

{1, 2, 7}{1, 3, 5}{1, 6, 4}{2, 6, 3}{2, 5, 4}{3, 4, 7}{5, 6, 7}

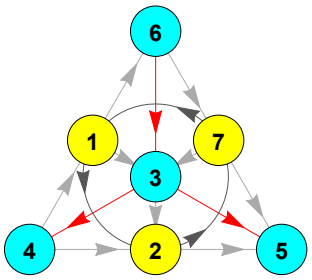
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_5	$-e_6$	$-e_3$	e_4	$-e_2$
e_2	$-e_7$	−1	$-e_6$	$-e_5$	e_4	e_3	e_1
e_3	$-e_5$	e_6	−1	e_7	e_1	$-e_2$	$-e_4$
e_4	e_6	e_5	$-e_7$	−1	$-e_2$	$-e_1$	e_3
e_5	e_3	$-e_4$	$-e_1$	e_2	−1	e_7	$-e_6$
e_6	$-e_4$	$-e_3$	e_2	e_1	$-e_7$	−1	e_5
e_7	e_2	$-e_1$	e_4	$-e_3$	e_6	$-e_5$	−1

split=1

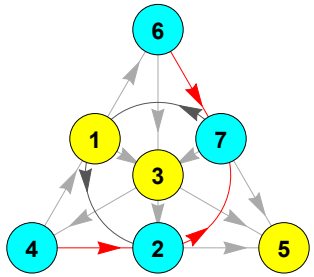
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	5	−6	−3	4	−2
2	−7	−1	−6	−5	4	3	1
3	−5	6	1	−7	−1	2	−4
4	6	5	7	1	2	1	3
5	3	−4	1	−2	1	−7	−6
6	−4	−3	−2	−1	7	1	5
7	2	−1	4	−3	6	−5	−1

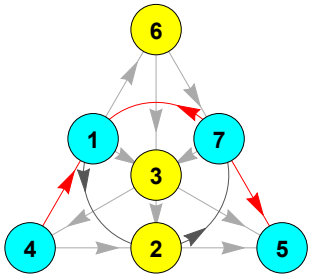
split=2

Fano plane



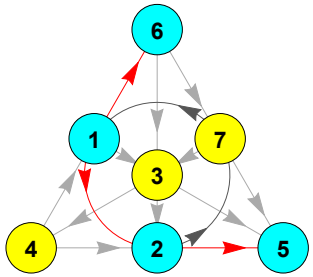
split=4

Fano plane



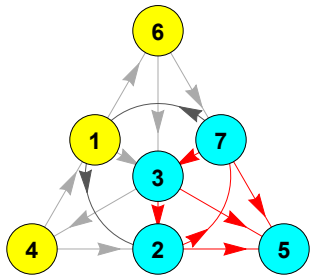
split=6

Fano plane



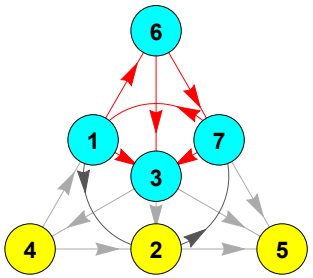
split=3

Fano plane



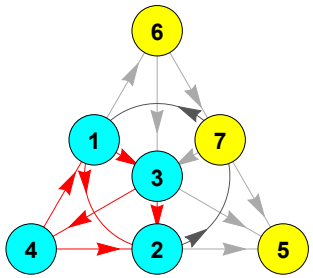
split=5

Fano plane



split=7

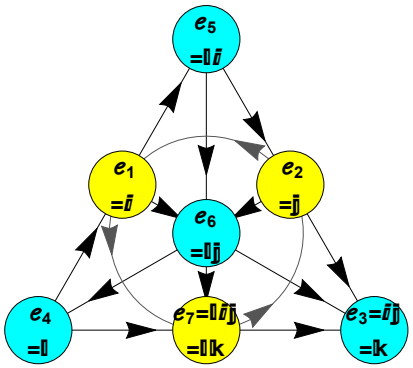
Fano plane



flip=True

{1, 7, 2}{1, 6, 3}{1, 5, 4}{2, 3, 5}{2, 6, 4}{3, 4, 7}{5, 6, 7}

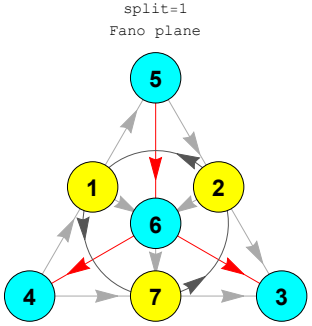
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	$-e_6$	$-e_5$	e_4	e_3	e_2
e_2	e_7	−1	e_5	$-e_6$	$-e_3$	e_4	$-e_1$
e_3	e_6	$-e_5$	−1	e_7	e_2	$-e_1$	$-e_4$
e_4	e_5	e_6	$-e_7$	−1	$-e_1$	$-e_2$	e_3
e_5	$-e_4$	e_3	$-e_2$	e_1	−1	e_7	$-e_6$
e_6	$-e_3$	$-e_4$	e_1	e_2	$-e_7$	−1	e_5
e_7	$-e_2$	e_1	e_4	$-e_3$	e_6	$-e_5$	−1

split=1

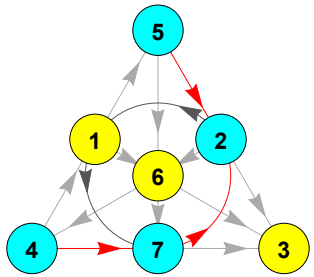
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−6	−5	4	3	2
2	7	−1	5	−6	−3	4	−1
3	6	−5	1	−7	−2	1	−4
4	5	6	7	1	1	2	3
5	−4	3	2	−1	1	−7	−6
6	−3	−4	−1	−2	7	1	5
7	−2	1	4	−3	6	−5	−1

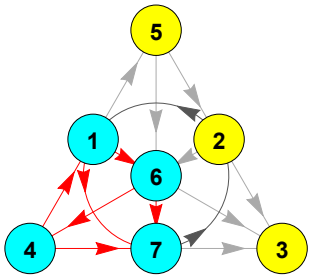
split=2

Fano plane



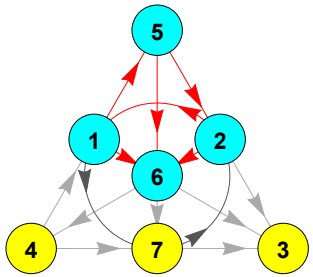
split=4

Fano plane



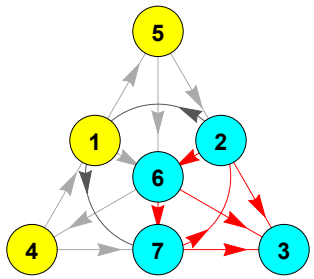
split=6

Fano plane



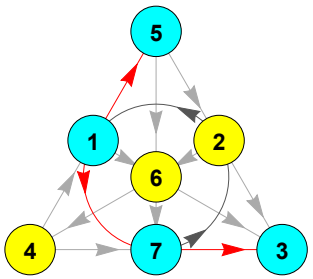
split=3

Fano plane



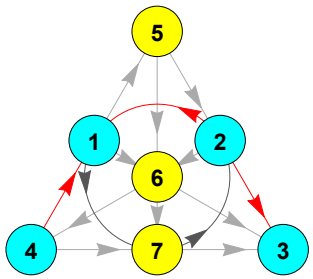
split=5

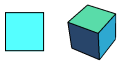
Fano plane



split=7

Fano plane

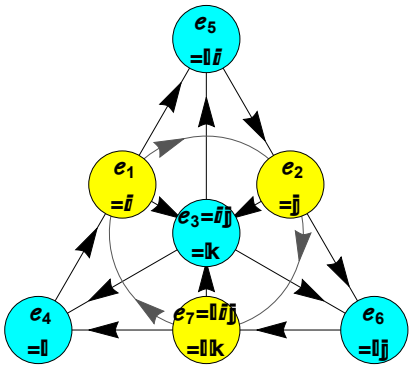


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
236	$b_{c_1}^{\rightarrow -1/3}$		0apggsscc 000110110_2	Bn{ 1 0 1 1 1 1 0 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\overline{Nb}}$ 41

flip=False

{1, 2, 7}{1, 3, 6}{1, 5, 4}{2, 3, 4}{2, 6, 5}{3, 5, 7}{4, 6, 7}

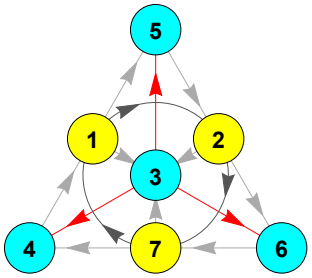
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	e_6	$-e_5$	e_4	$-e_3$	$-e_2$
e_2	$-e_7$	−1	e_4	$-e_3$	$-e_6$	e_5	e_1
e_3	$-e_6$	$-e_4$	−1	e_2	e_7	e_1	$-e_5$
e_4	e_5	e_3	$-e_2$	−1	$-e_1$	e_7	$-e_6$
e_5	$-e_4$	e_6	$-e_7$	e_1	−1	$-e_2$	e_3
e_6	e_3	$-e_5$	$-e_1$	$-e_7$	e_2	−1	e_4
e_7	e_2	$-e_1$	e_5	e_6	$-e_3$	$-e_4$	−1

split=1

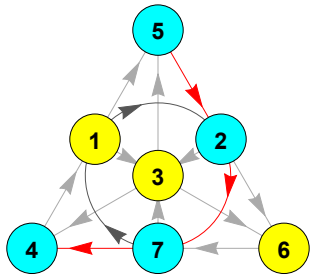
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	6	−5	4	−3	−2
2	−7	−1	4	−3	−6	5	1
3	−6	−4	1	−2	−7	−1	−5
4	5	3	2	1	1	−7	−6
5	−4	6	7	−1	1	2	3
6	3	−5	1	7	−2	1	4
7	2	−1	5	6	−3	−4	−1

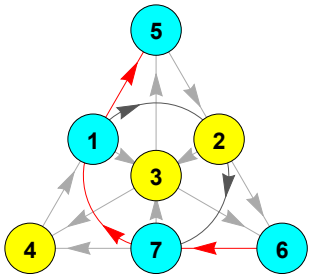
split=2

Fano plane



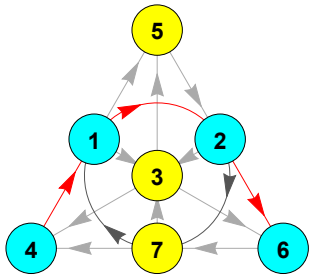
split=4

Fano plane



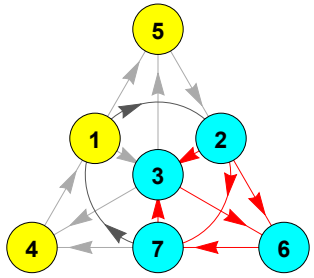
split=6

Fano plane



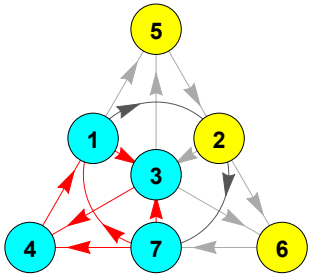
split=3

Fano plane



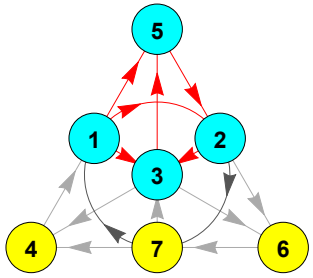
split=5

Fano plane



split=7

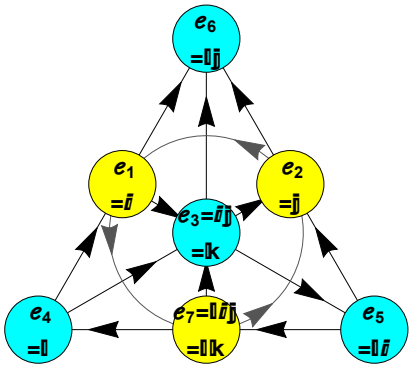
Fano plane



flip=True

{1, 7, 2}{1, 3, 5}{1, 6, 4}{2, 4, 3}{2, 6, 5}{3, 6, 7}{4, 5, 7}

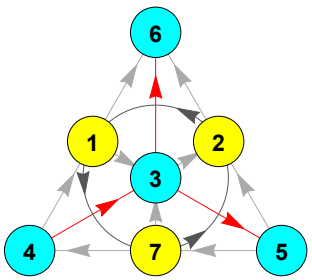
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_5	$-e_6$	$-e_3$	e_4	e_2
e_2	e_7	−1	$-e_4$	e_3	$-e_6$	e_5	$-e_1$
e_3	$-e_5$	e_4	−1	$-e_2$	e_1	e_7	$-e_6$
e_4	e_6	$-e_3$	e_2	−1	e_7	$-e_1$	$-e_5$
e_5	e_3	e_6	$-e_1$	$-e_7$	−1	$-e_2$	e_4
e_6	$-e_4$	$-e_5$	$-e_7$	e_1	e_2	−1	e_3
e_7	$-e_2$	e_1	e_6	e_5	$-e_4$	$-e_3$	−1

split=1

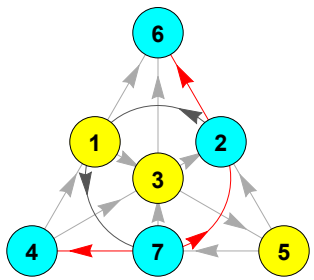
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	5	−6	−3	4	2
2	7	−1	−4	3	−6	5	−1
3	−5	4	1	2	−1	−7	−6
4	6	−3	−2	1	−7	1	−5
5	3	6	1	7	1	2	4
6	−4	−5	7	−1	−2	1	3
7	−2	1	6	5	−4	−3	−1

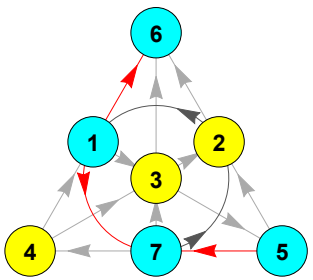
split=2

Fano plane



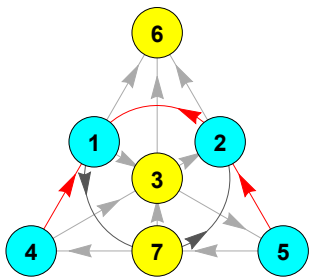
split=4

Fano plane



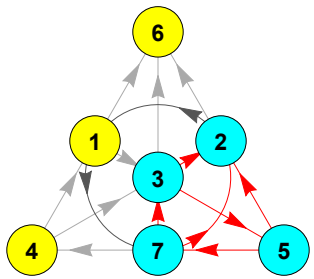
split=6

Fano plane



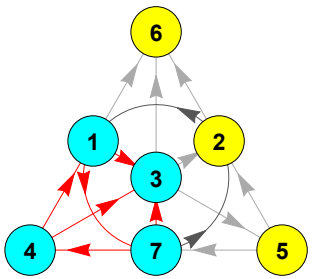
split=3

Fano plane



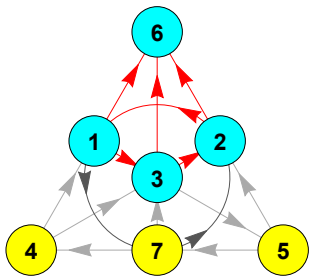
split=5

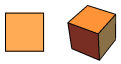
Fano plane



split=7

Fano plane

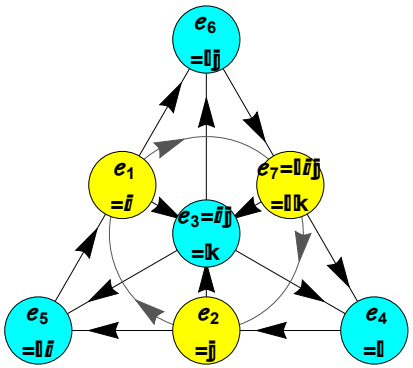


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
237	$b_{o_1}^{\overrightarrow{R}^{\to -1/3}}$		0apggsscc 000110101_2	Bn{ 1 0 1 1 1 0 1 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\overline{Cd}}$ 48

flip=False

{1, 7, 2}{1, 3, 4}{1, 6, 5}{2, 3, 6}{2, 5, 4}{3, 5, 7}{4, 6, 7}

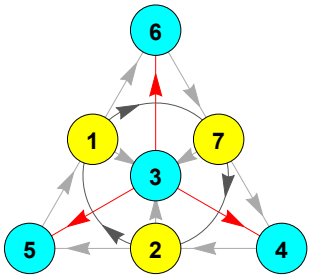
Fano plane



	e1	e2	e3	e4	e5	e6	e7
1	1	e2	e3	e4	e5	e6	e7
e1	-1	-e7	e4	-e3	-e6	e5	e2
e2	e7	-1	e6	-e5	e4	-e3	-e1
e3	-e4	-e6	-1	e1	e7	e2	-e5
e4	e3	e5	-e1	-1	-e2	e7	-e6
e5	e6	-e4	-e7	e2	-1	-e1	e3
e6	-e5	e3	-e2	-e7	e1	-1	e4
e7	-e2	e1	e5	e6	-e3	-e4	-1

split=1

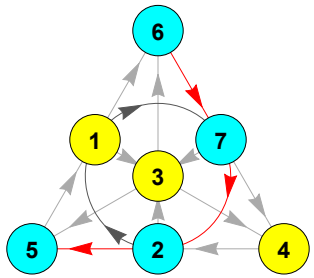
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	-7	4	-3	-6	5	2
2	7	-1	6	-5	4	-3	-1
3	-4	-6	1	-1	-7	-2	-5
4	3	5	1	1	2	-7	-6
5	6	-4	7	-2	1	1	3
6	-5	3	2	7	-1	1	4
7	-2	1	5	6	-3	-4	-1

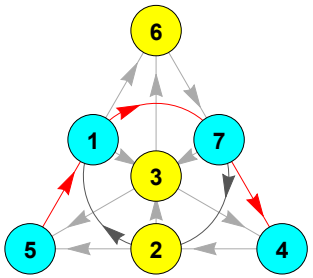
split=2

Fano plane



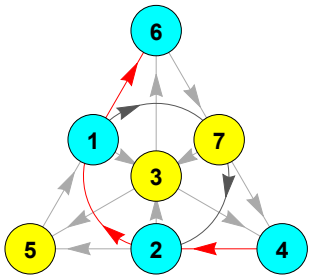
split=4

Fano plane



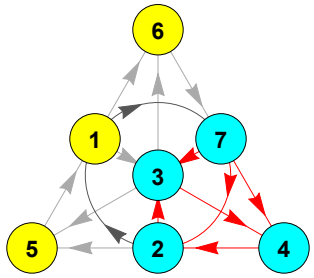
split=6

Fano plane



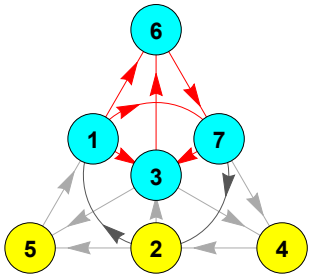
split=3

Fano plane



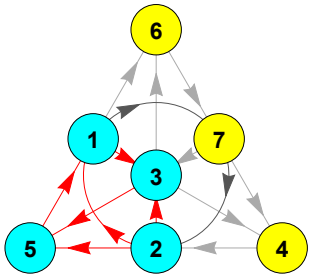
split=5

Fano plane



split=7

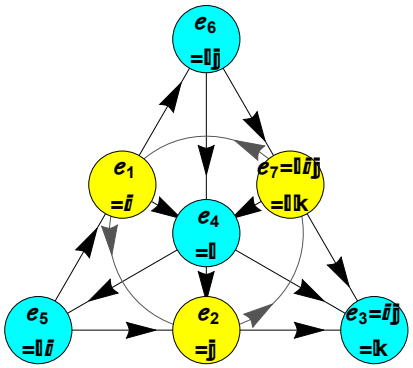
Fano plane



flip=True

{1, 2, 7}{1, 4, 3}{1, 6, 5}{2, 3, 5}{2, 6, 4}{3, 6, 7}{4, 5, 7}

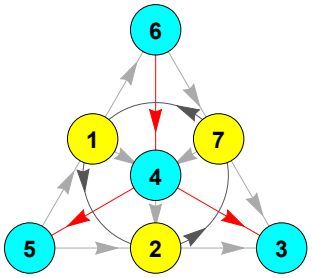
Fano plane



	e1	e2	e3	e4	e5	e6	e7
1	1	e2	e3	e4	e5	e6	e7
e1	-1	e7	-e4	e3	-e6	e5	-e2
e2	-e7	-1	e5	-e6	-e3	e4	e1
e3	e4	-e5	-1	-e1	e2	e7	-e6
e4	-e3	e6	e1	-1	e7	-e2	-e5
e5	e6	e3	-e2	-e7	-1	-e1	e4
e6	-e5	-e4	-e7	e2	e1	-1	e3
e7	e2	-e1	e6	e5	-e4	-e3	-1

split=1

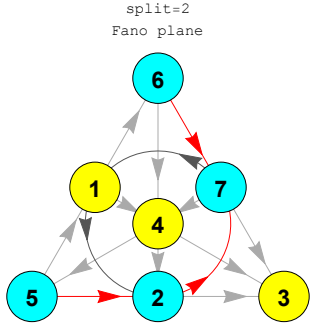
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	7	-4	3	-6	5	-2
2	-7	-1	5	-6	-3	4	1
3	4	-5	1	1	-2	-7	-6
4	-3	6	-1	1	-7	2	-5
5	6	3	2	7	1	1	4
6	-5	-4	7	-2	-1	1	3
7	2	-1	6	5	-4	-3	-1

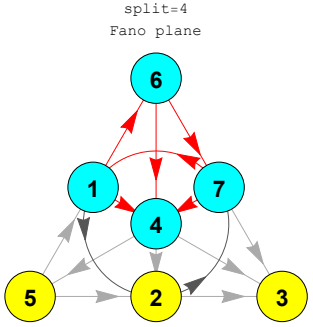
split=2

Fano plane



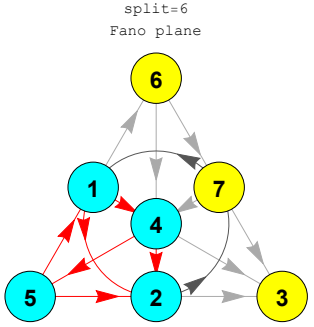
split=4

Fano plane



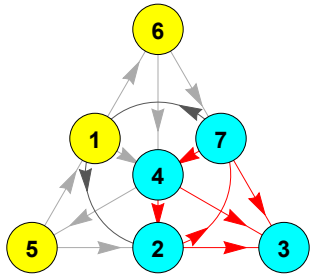
split=6

Fano plane



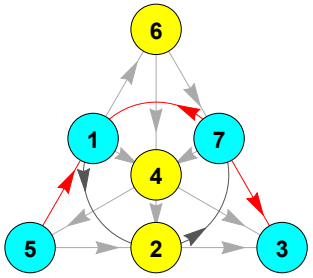
split=3

Fano plane



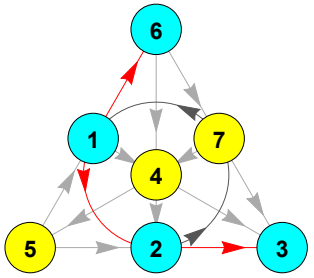
split=5

Fano plane



split=7

Fano plane

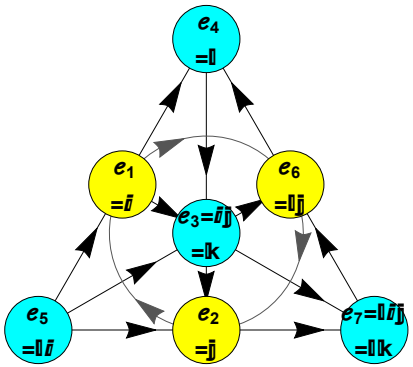


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
238	$\overline{V_t}^{\,0}_{w_d}$		0apggsscc 011110000_2	Bn{ 1 0 1 1 0 1 1 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{1}$ 53

flip=False

{1, 6, 2}{1, 3, 7}{1, 4, 5}{2, 4, 3}{2, 7, 5}{3, 6, 5}{4, 7, 6}

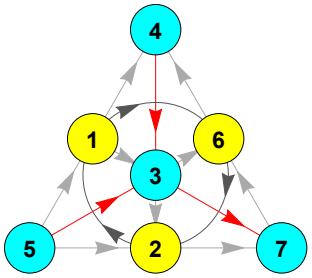
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	e_7	e_5	$-e_4$	e_2	$-e_3$
e_2	e_2	e_6	−1	$-e_4$	e_3	$-e_7$	$-e_1$	e_5
e_3	e_3	e_7	e_4	−1	$-e_2$	e_6	e_5	e_1
e_4	e_4	$-e_5$	$-e_3$	e_2	−1	e_1	$-e_7$	e_6
e_5	e_5	e_4	e_7	e_6	$-e_1$	−1	$-e_3$	$-e_2$
e_6	e_6	$-e_2$	e_1	$-e_5$	e_7	e_3	−1	$-e_4$
e_7	e_7	e_3	$-e_5$	$-e_1$	$-e_6$	e_2	e_4	−1

split=1

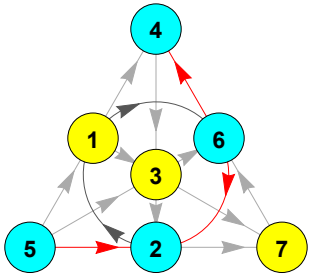
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	7	5	−4	2	−3
2	6	−1	−4	3	−7	−1	5
3	−7	4	1	2	6	5	−1
4	−5	−3	−2	1	−1	−7	−6
5	4	7	−6	1	1	−3	2
6	−2	1	−5	7	3	−1	−4
7	3	−5	1	6	−2	4	1

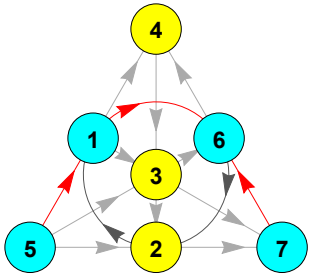
split=2

Fano plane



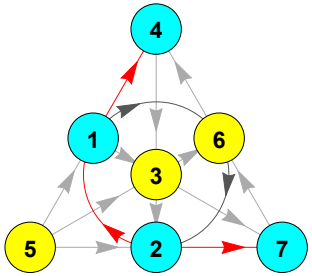
split=4

Fano plane



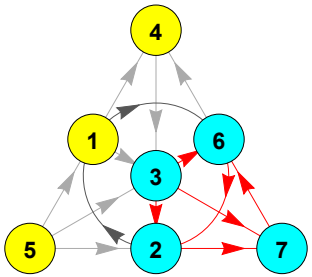
split=6

Fano plane



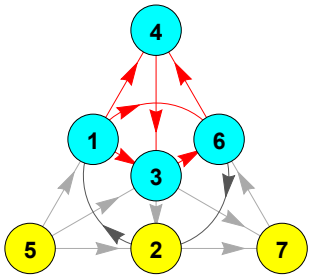
split=3

Fano plane



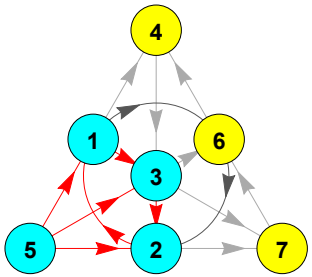
split=5

Fano plane



split=7

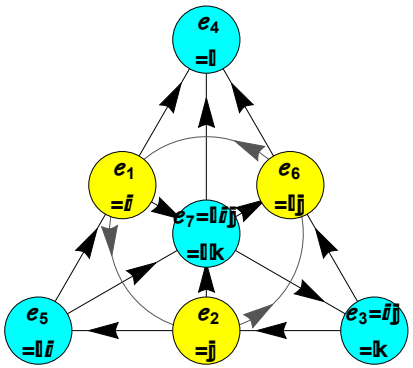
Fano plane



flip=True

{1, 2, 6}{1, 7, 3}{1, 4, 5}{2, 5, 3}{2, 7, 4}{3, 6, 4}{5, 7, 6}

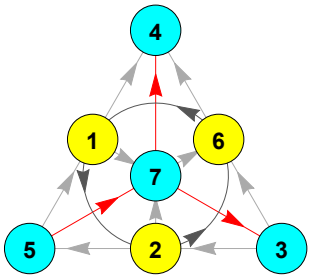
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_6	$-e_7$	e_5	$-e_4$	$-e_2$	e_3
e_2	$-e_6$	−1	$-e_5$	$-e_7$	e_3	e_1	e_4	
e_3	e_7	e_5	−1	$-e_6$	$-e_2$	e_4	$-e_1$	
e_4	$-e_5$	e_7	e_6	−1	e_1	$-e_3$	$-e_2$	
e_5	e_4	$-e_3$	e_2	$-e_1$	−1	$-e_7$	e_6	
e_6	e_2	$-e_1$	$-e_4$	e_3	e_7	−1	$-e_5$	
e_7	$-e_3$	$-e_4$	e_1	e_2	$-e_6$	e_5	−1	

split=1

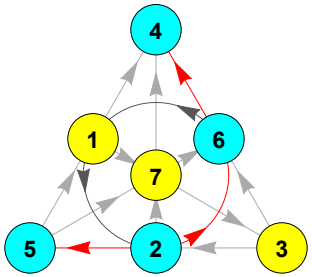
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	−7	5	−4	−2	3
2	−6	−1	−5	−7	3	1	4
3	7	5	1	6	2	4	1
4	−5	7	−6	1	−1	−3	2
5	4	−3	−2	1	1	−7	−6
6	2	−1	−4	3	7	−1	−5
7	−3	−4	−1	−2	6	5	1

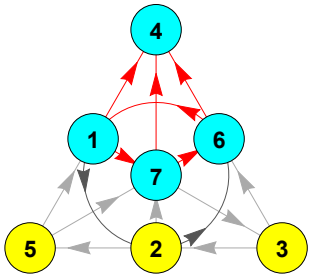
split=2

Fano plane



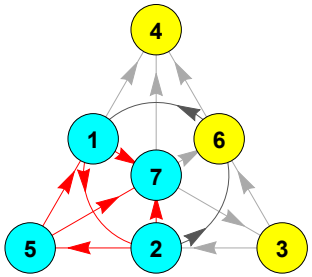
split=4

Fano plane



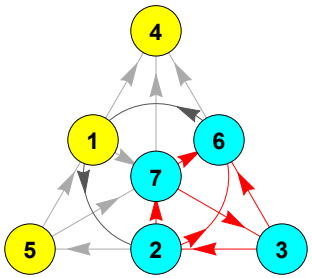
split=6

Fano plane



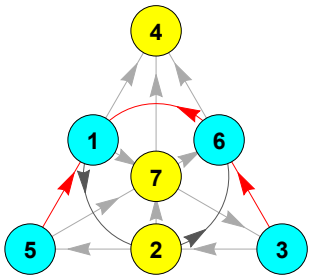
split=3

Fano plane



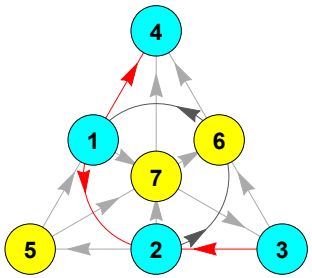
split=5

Fano plane



split=7

Fano plane

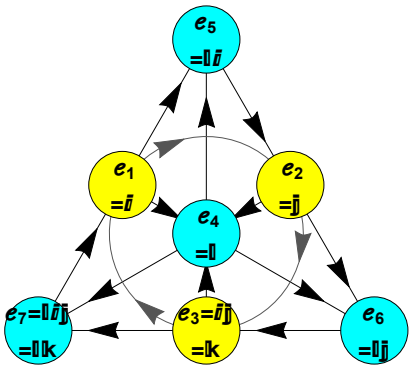


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
239	$\overline{e}_{ym}^{\dagger}$	▽	0apggsscc 010011000_2	Bn{ 1 0 1 0 1 1 1 1 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\overline{Pr}}$ 59

flip=False

{1, 2, 3}{1, 4, 6}{1, 5, 7}{2, 4, 7}{2, 6, 5}{3, 4, 5}{3, 7, 6}

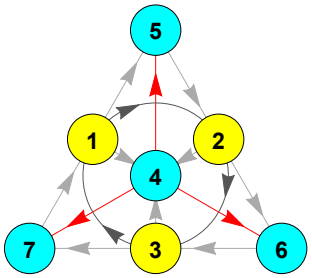
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	e_6	e_7	$-e_4$	$-e_5$
e_2	e_2	$-e_3$	−1	e_1	e_7	$-e_6$	e_5	$-e_4$
e_3	e_3	e_2	$-e_1$	−1	e_5	$-e_4$	$-e_7$	e_6
e_4	e_4	$-e_6$	$-e_7$	$-e_5$	−1	e_3	e_1	e_2
e_5	e_5	$-e_7$	e_6	e_4	$-e_3$	−1	$-e_2$	e_1
e_6	e_6	e_4	$-e_5$	e_7	$-e_1$	e_2	−1	$-e_3$
e_7	e_7	e_5	e_4	$-e_6$	$-e_2$	$-e_1$	e_3	−1

split=1

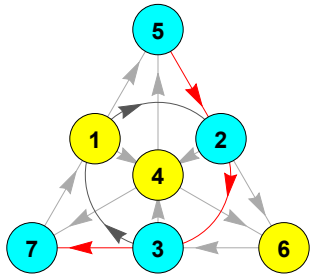
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	6	7	−4	−5
2	−3	−1	1	7	−6	5	−4
3	2	−1	−1	5	−4	−7	6
4	−6	−7	−5	1	−3	−1	−2
5	−7	6	4	3	1	2	−1
6	4	−5	7	1	−2	1	3
7	5	4	−6	2	1	−3	1

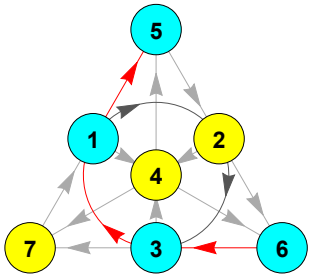
split=2

Fano plane



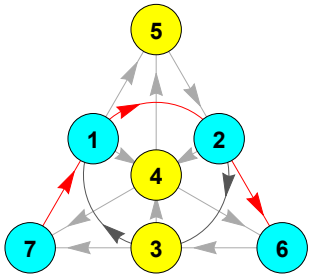
split=4

Fano plane



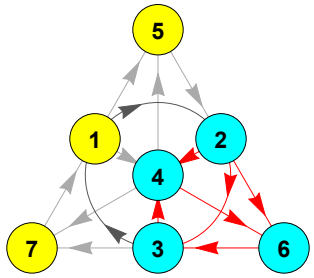
split=6

Fano plane



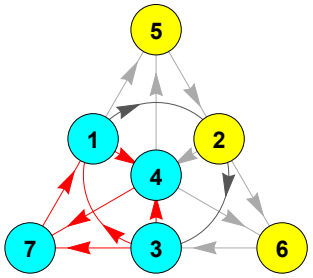
split=3

Fano plane



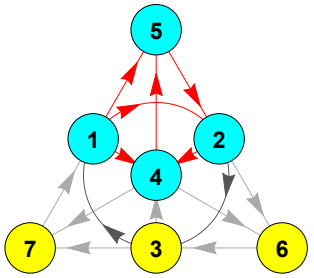
split=5

Fano plane



split=7

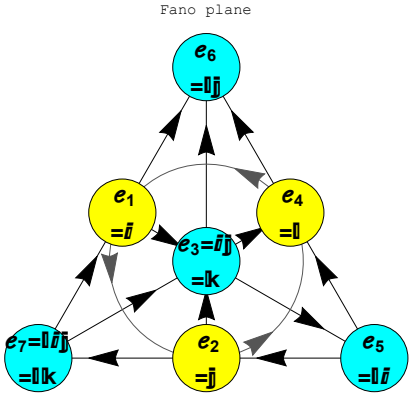
Fano plane



flip=True

{1, 2, 4}{1, 3, 5}{1, 6, 7}{2, 3, 6}{2, 7, 5}{3, 4, 7}{4, 6, 5}

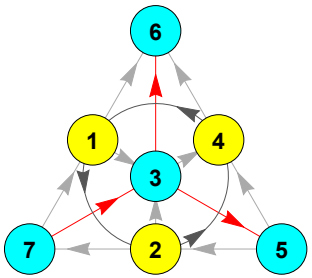
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	e_5	$-e_2$	$-e_3$	e_7	$-e_6$
e_2	e_2	$-e_4$	−1	e_6	e_1	$-e_7$	$-e_3$	e_5
e_3	e_3	$-e_5$	$-e_6$	−1	e_7	e_1	e_2	$-e_4$
e_4	e_4	e_2	$-e_1$	$-e_7$	−1	$-e_6$	e_5	e_3
e_5	e_5	e_3	e_7	$-e_1$	e_6	−1	$-e_4$	$-e_2$
e_6	e_6	$-e_7$	e_3	$-e_2$	$-e_5$	e_4	−1	e_1
e_7	e_7	e_6	$-e_5$	e_4	$-e_3$	e_2	$-e_1$	−1

split=1

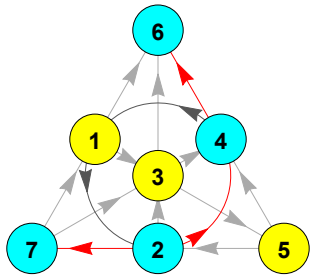
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	5	−2	−3	7	−6
2	−4	−1	6	1	−7	−3	5
3	−5	−6	1	7	−1	−2	4
4	2	−1	−7	−1	−6	5	3
5	3	7	1	6	1	4	2
6	−7	3	2	−5	−4	1	−1
7	6	−5	−4	−3	−2	1	1

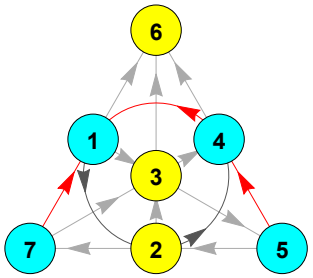
split=2

Fano plane



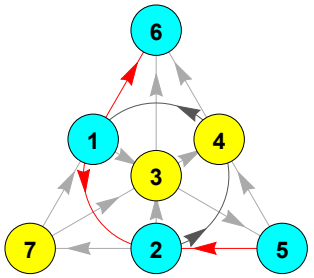
split=4

Fano plane



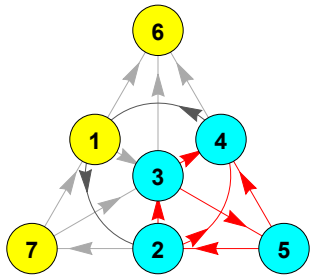
split=6

Fano plane



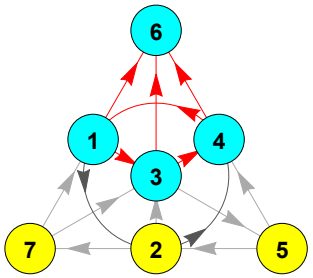
split=3

Fano plane



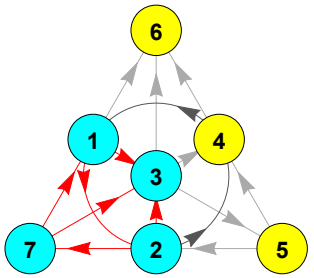
split=5

Fano plane



split=7

Fano plane

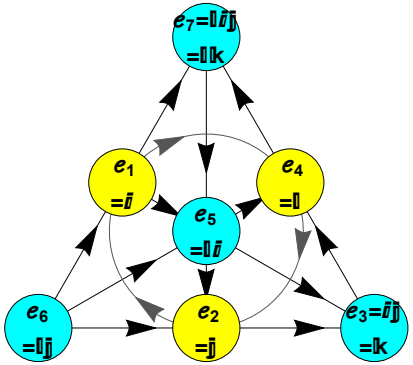


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits		Binary / E8 Coordinates									Ele #
240	$\overline{\text{Ve}}^{0}_{\text{Wm}}$	▽	0apggsscc 011011000_2	Bn{ E8{	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Tb}}$ 65

flip=False

{1, 4, 2}{1, 5, 3}{1, 7, 6}{2, 3, 6}{2, 7, 5}{3, 4, 7}{4, 6, 5}

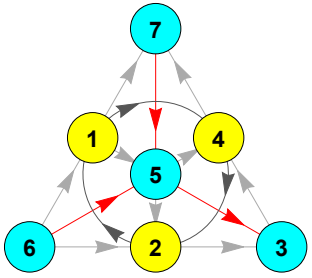
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_4$	$-e_5$	e_2	e_3	$-e_7$	e_6
e_2	e_4	−1	e_6	$-e_1$	$-e_7$	$-e_3$	e_5
e_3	e_5	$-e_6$	−1	e_7	$-e_1$	e_2	$-e_4$
e_4	$-e_2$	e_1	$-e_7$	−1	$-e_6$	e_5	e_3
e_5	$-e_3$	e_7	e_1	e_6	−1	$-e_4$	$-e_2$
e_6	e_7	e_3	$-e_2$	$-e_5$	e_4	−1	$-e_1$
e_7	$-e_6$	$-e_5$	e_4	$-e_3$	e_2	e_1	−1

split=1

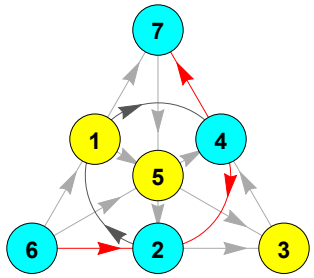
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	−5	2	3	−7	6
2	4	−1	6	−1	−7	−3	5
3	5	−6	1	7	1	−2	4
4	−2	1	−7	−1	−6	5	3
5	−3	7	−1	6	1	4	2
6	7	3	2	−5	−4	1	1
7	−6	−5	−4	−3	−2	−1	1

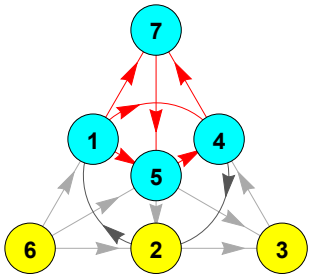
split=2

Fano plane



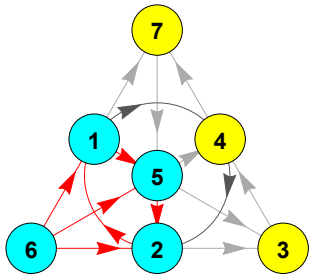
split=4

Fano plane



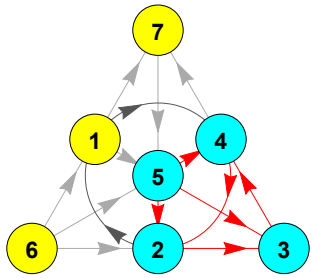
split=6

Fano plane



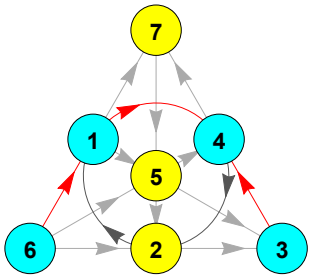
split=3

Fano plane



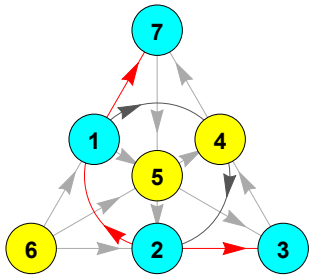
split=5

Fano plane



split=7

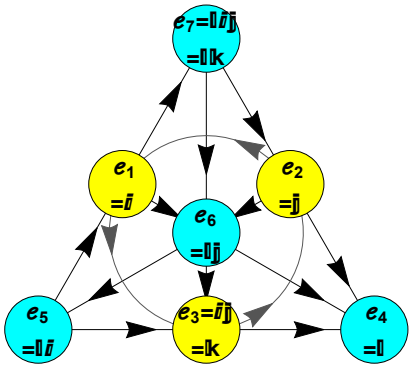
Fano plane



flip=True

{1, 3, 2}{1, 6, 4}{1, 7, 5}{2, 4, 7}{2, 6, 5}{3, 4, 5}{3, 7, 6}

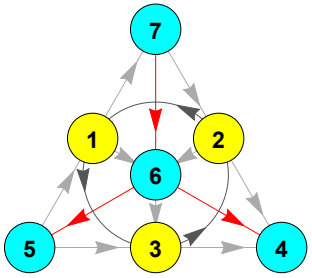
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_3$	e_2	$-e_6$	$-e_7$	e_4	e_5
e_2	e_3	−1	$-e_1$	e_7	$-e_6$	e_5	$-e_4$
e_3	$-e_2$	e_1	−1	e_5	$-e_4$	$-e_7$	e_6
e_4	e_6	$-e_7$	$-e_5$	−1	e_3	$-e_1$	e_2
e_5	e_7	e_6	e_4	$-e_3$	−1	$-e_2$	$-e_1$
e_6	$-e_4$	$-e_5$	e_7	e_1	e_2	−1	$-e_3$
e_7	$-e_5$	e_4	$-e_6$	$-e_2$	e_1	e_3	−1

split=1

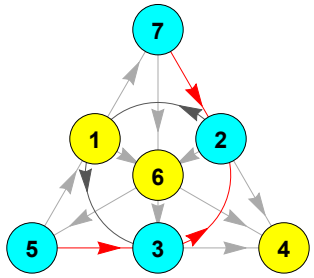
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	−6	−7	4	5
2	3	−1	−1	7	−6	5	−4
3	−2	1	−1	5	−4	−7	6
4	6	−7	−5	1	−3	1	−2
5	7	6	4	3	1	2	1
6	−4	−5	7	−1	−2	1	3
7	−5	4	−6	2	−1	−3	1

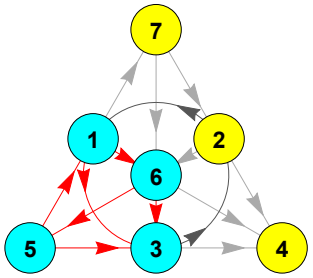
split=2

Fano plane



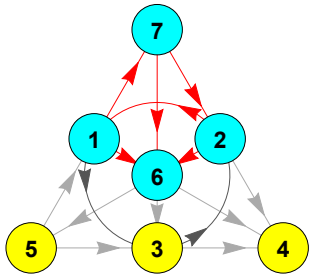
split=4

Fano plane



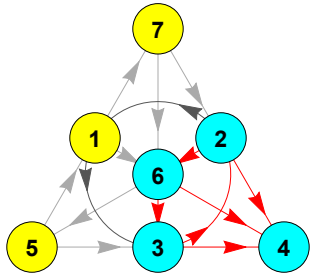
split=6

Fano plane



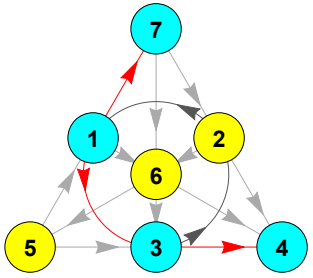
split=3

Fano plane



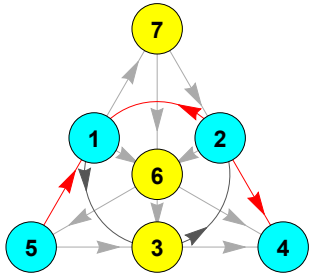
split=5

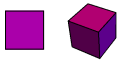
Fano plane



split=7

Fano plane

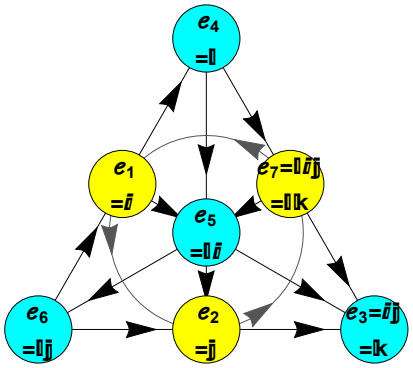


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
241	$b_{m_d}^{-1/3}$		0apggsscc 000110011_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	} }	Np 93

flip=False

{1, 2, 7}{1, 5, 3}{1, 4, 6}{2, 3, 6}{2, 4, 5}{3, 4, 7}{5, 6, 7}

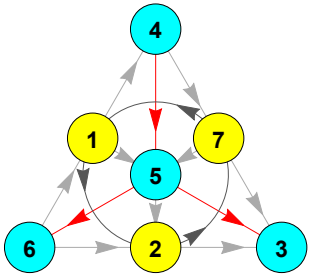
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_7	$-e_5$	e_6	e_3	$-e_4$	$-e_2$
e_2	$-e_7$	−1	e_6	e_5	$-e_4$	$-e_3$	e_1
e_3	e_5	$-e_6$	−1	e_7	$-e_1$	e_2	$-e_4$
e_4	$-e_6$	$-e_5$	$-e_7$	−1	e_2	e_1	e_3
e_5	$-e_3$	e_4	e_1	$-e_2$	−1	e_7	$-e_6$
e_6	e_4	e_3	$-e_2$	$-e_1$	$-e_7$	−1	e_5
e_7	e_2	$-e_1$	e_4	$-e_3$	e_6	$-e_5$	−1

split=1

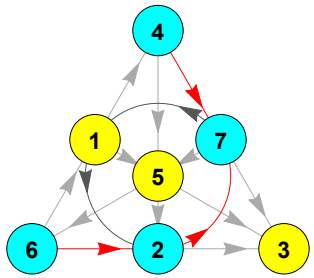
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−5	6	3	−4	−2
2	−7	−1	6	5	−4	−3	1
3	5	−6	1	−7	1	−2	−4
4	−6	−5	7	1	−2	−1	3
5	−3	4	−1	2	1	−7	−6
6	4	3	2	1	7	1	5
7	2	−1	4	−3	6	−5	−1

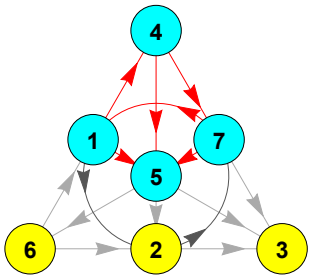
split=2

Fano plane



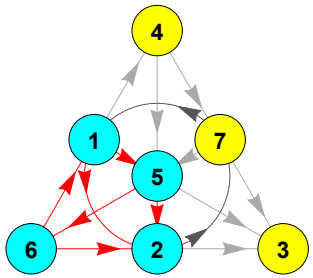
split=4

Fano plane



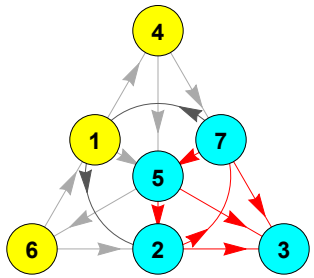
split=6

Fano plane



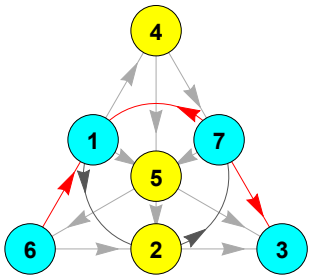
split=3

Fano plane



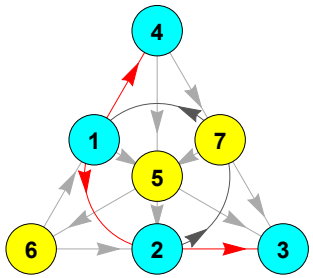
split=5

Fano plane



split=7

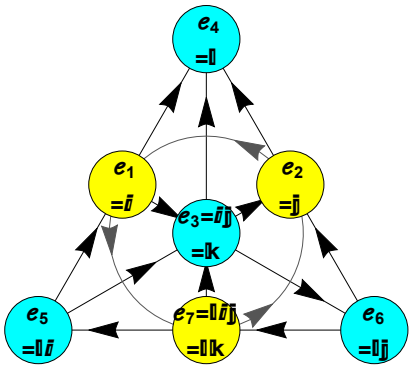
Fano plane



flip=True

{1, 7, 2}{1, 3, 6}{1, 4, 5}{2, 5, 3}{2, 4, 6}{3, 4, 7}{5, 6, 7}

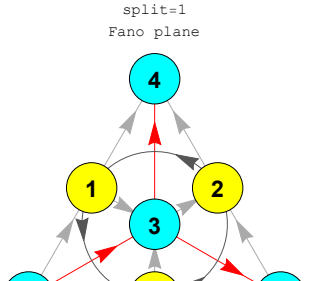
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_7$	e_6	e_6	e_5	$-e_4$	$-e_3$	e_2
e_2	e_7	−1	$-e_5$	e_6	e_3	$-e_4$	$-e_1$
e_3	$-e_6$	e_5	−1	e_7	$-e_2$	e_1	$-e_4$
e_4	$-e_5$	$-e_6$	$-e_7$	−1	e_1	e_2	e_3
e_5	e_4	$-e_3$	e_2	$-e_1$	−1	e_7	$-e_6$
e_6	e_3	e_4	$-e_1$	$-e_2$	$-e_7$	−1	e_5
e_7	$-e_2$	e_1	e_4	$-e_3$	e_6	$-e_5$	−1

split=1

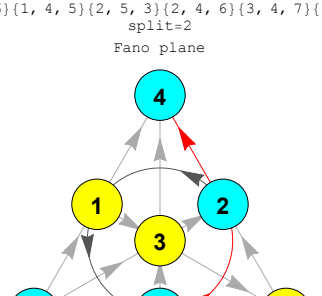
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	6	5	−4	−3	2
2	7	−1	−5	6	3	−4	−1
3	−6	5	1	−7	2	−1	−4
4	−5	−6	7	1	−1	−2	3
5	4	−3	−2	1	1	−7	−6
6	3	4	1	2	7	1	5
7	−2	1	4	−3	6	−5	−1

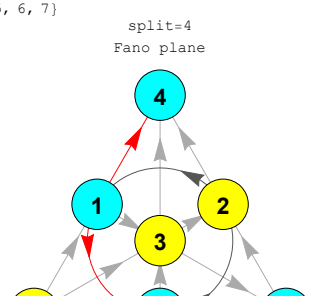
split=2

Fano plane



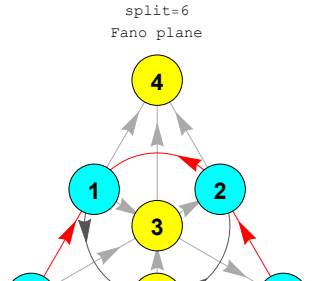
split=4

Fano plane



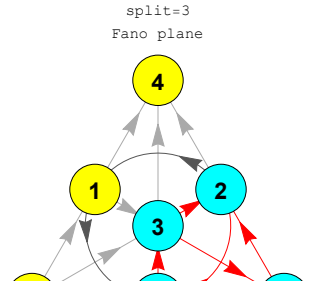
split=6

Fano plane



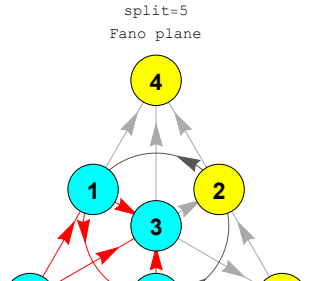
split=3

Fano plane



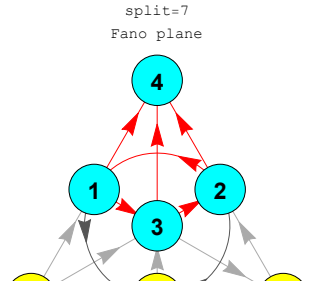
split=5

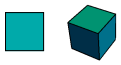
Fano plane



split=7

Fano plane

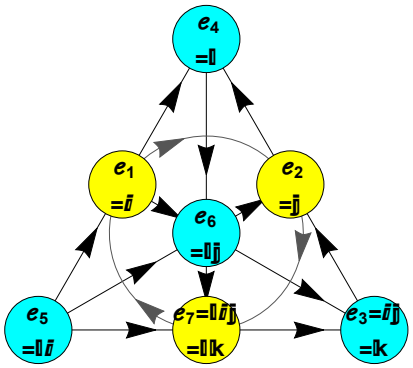


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
242	$\overset{\rightarrow -1/3}{\underset{c_d}{b}}$		0apggsscc 0001100101_2	Bn{ 0 1 1 1 1 1 0 1 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Sn}$ 50

flip=False

{1, 2, 7}{1, 6, 3}{1, 4, 5}{2, 4, 3}{2, 5, 6}{3, 5, 7}{4, 6, 7}

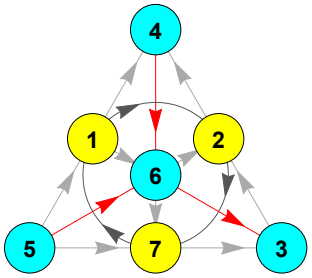
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_7	e_6	e_5	e_4	e_3	e_2
e_1	−1	e_3	$-e_2$	e_7	$-e_6$	e_5	$-e_4$
e_2	$-e_7$	−1	e_4	$-e_3$	e_6	$-e_5$	e_1
e_3	e_6	$-e_4$	−1	e_2	$-e_7$	e_1	$-e_5$
e_4	$-e_5$	e_3	$-e_2$	−1	e_1	e_7	$-e_6$
e_5	e_4	$-e_6$	e_7	$-e_1$	−1	e_2	e_3
e_6	$-e_3$	e_5	e_1	$-e_7$	$-e_2$	−1	e_4
e_7	e_2	$-e_1$	e_5	e_6	$-e_3$	$-e_4$	−1

split=1

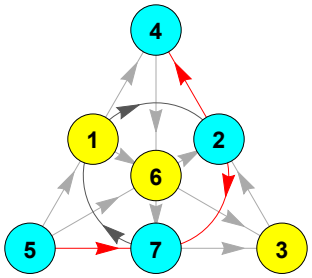
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	−6	5	−4	3	−2
2	−7	−1	−4	3	6	−5	1
3	6	4	1	2	−7	1	−5
4	−5	−3	−2	1	−1	−7	−6
5	4	−6	7	1	1	−2	3
6	−3	5	−1	7	2	1	4
7	2	−1	5	6	−3	−4	−1

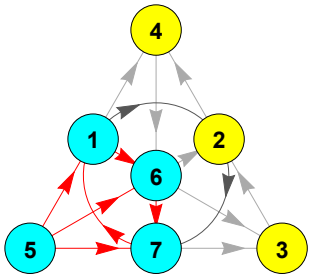
split=2

Fano plane



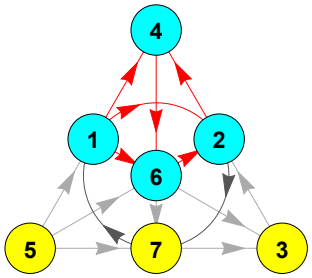
split=4

Fano plane



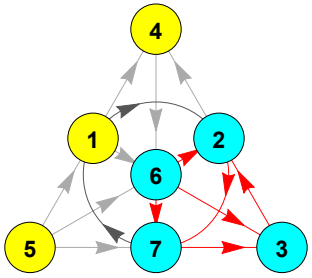
split=6

Fano plane



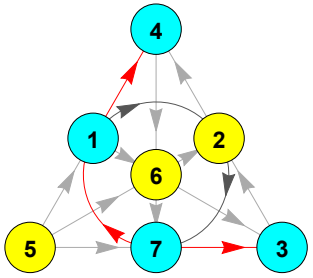
split=3

Fano plane



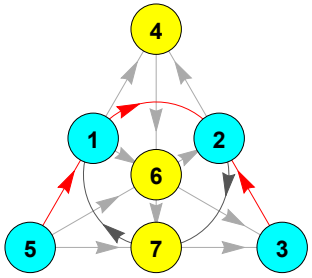
split=5

Fano plane



split=7

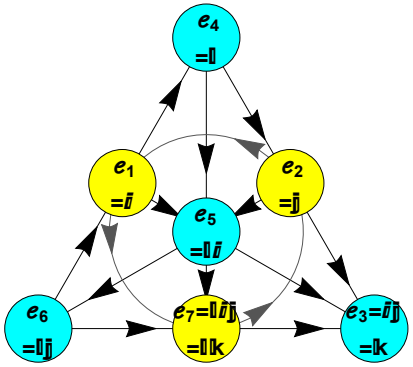
Fano plane



flip=True

{1, 7, 2}{1, 5, 3}{1, 4, 6}{2, 3, 4}{2, 5, 6}{3, 6, 7}{4, 5, 7}

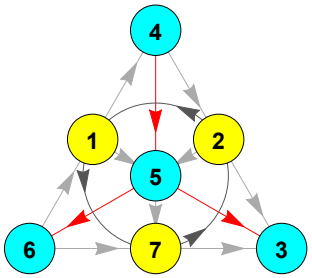
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	e_1	e_7	e_6	e_5	e_4	e_3	e_2
e_1	−1	e_3	$-e_2$	e_7	$-e_6$	e_5	$-e_4$
e_2	$-e_7$	−1	e_4	$-e_3$	e_6	$-e_5$	e_1
e_3	e_5	$-e_4$	−1	e_2	$-e_1$	e_7	$-e_6$
e_4	$-e_6$	e_3	$-e_2$	−1	e_7	e_1	$-e_5$
e_5	$-e_3$	$-e_6$	e_1	$-e_7$	−1	e_2	e_4
e_6	e_4	e_5	$-e_7$	$-e_1$	$-e_2$	−1	e_3
e_7	$-e_2$	e_1	e_6	e_5	$-e_4$	$-e_3$	−1

split=1

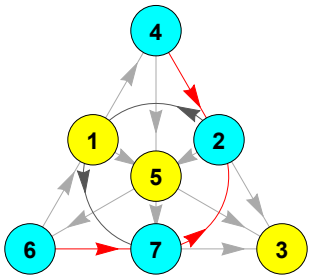
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−5	6	3	−4	2
2	7	−1	4	−3	6	−5	−1
3	5	−4	1	−2	1	−7	−6
4	−6	3	2	1	−7	−1	−5
5	−3	−6	−1	7	1	−2	4
6	4	5	7	1	2	1	3
7	−2	1	6	5	−4	−3	−1

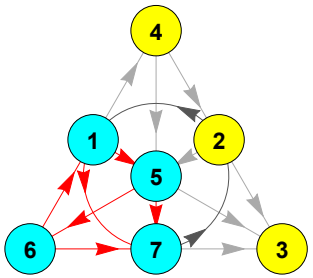
split=2

Fano plane



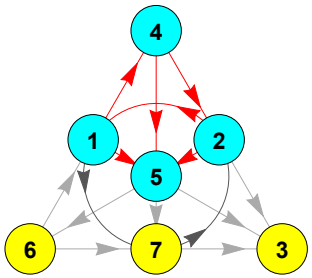
split=4

Fano plane



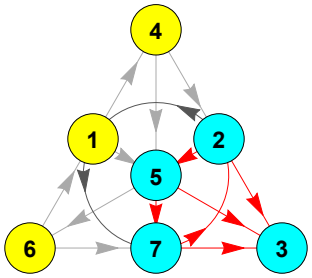
split=6

Fano plane



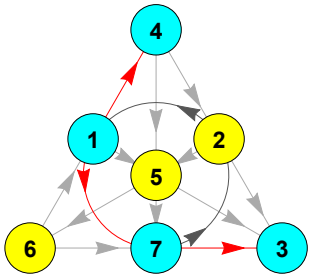
split=3

Fano plane



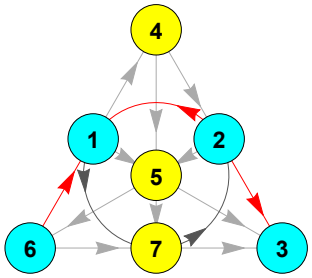
split=5

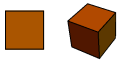
Fano plane



split=7

Fano plane

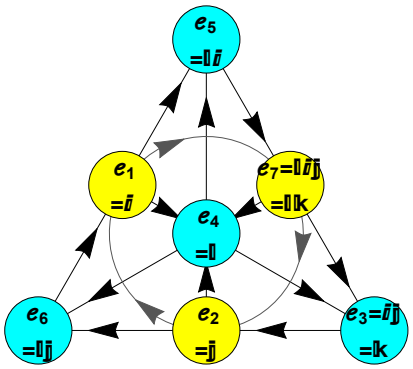


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
243	$b_{o_d}^{\vec{\tau}\to -1/3}$		0apggsscc 000110001_2	Bn{	0	1	1	1	1	0	1	1	}	Ba 56
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	

flip=False

{1, 7, 2}{1, 4, 3}{1, 5, 6}{2, 6, 3}{2, 4, 5}{3, 5, 7}{4, 6, 7}

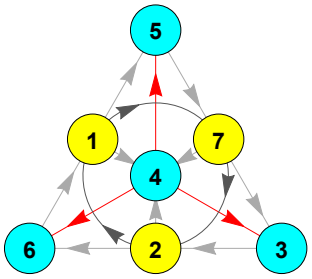
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	$-e_4$	e_3	e_6	$-e_5$	e_2
e_2	e_2	$-e_7$	−1	$-e_6$	e_5	$-e_4$	e_3	$-e_1$
e_3	e_3	e_4	e_6	−1	$-e_1$	e_7	$-e_2$	$-e_5$
e_4	e_4	$-e_3$	$-e_5$	e_1	−1	e_2	e_7	$-e_6$
e_5	e_5	$-e_6$	e_4	$-e_7$	$-e_2$	−1	e_1	e_3
e_6	e_6	e_5	$-e_3$	e_2	$-e_7$	$-e_1$	−1	e_4
e_7	e_7	$-e_2$	e_1	e_5	e_6	$-e_3$	$-e_4$	−1

split=1

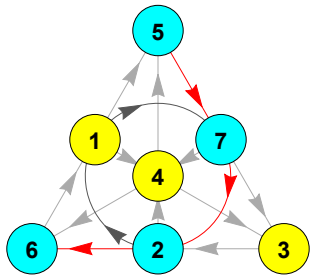
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−7	−4	3	6	−5	2
2	7	−1	−6	5	−4	3	−1
3	4	6	1	1	−7	2	−5
4	−3	−5	−1	1	−2	−7	−6
5	−6	4	7	2	1	−1	3
6	5	−3	−2	7	1	1	4
7	−2	1	5	6	−3	−4	−1

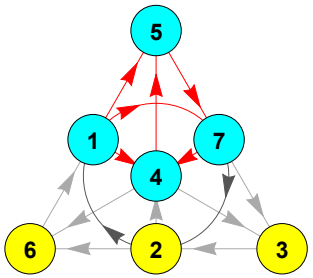
split=2

Fano plane



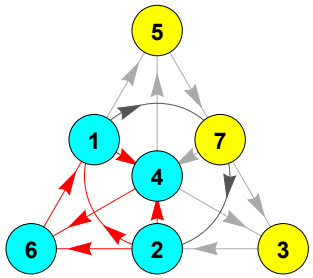
split=4

Fano plane



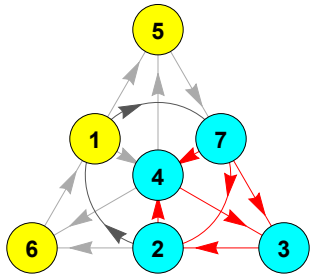
split=6

Fano plane



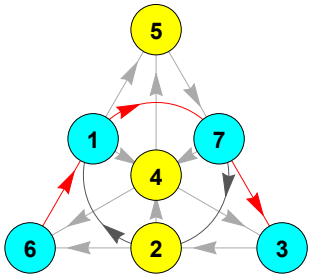
split=3

Fano plane



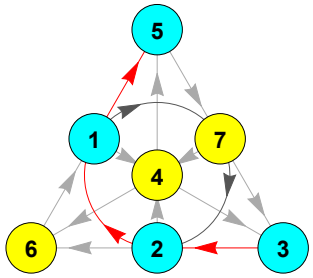
split=5

Fano plane



split=7

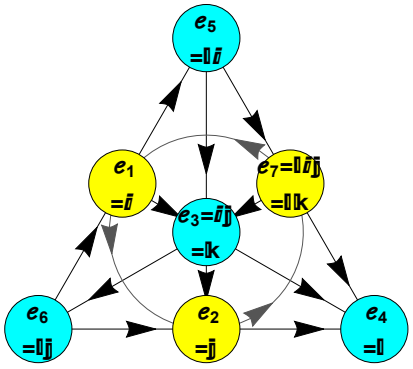
Fano plane



flip=True

{1, 2, 7}{1, 3, 4}{1, 5, 6}{2, 5, 3}{2, 4, 6}{3, 6, 7}{4, 5, 7}

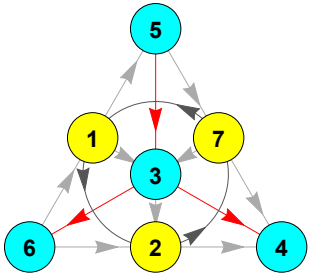
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_7	e_4	$-e_3$	e_6	$-e_5$	$-e_2$
e_2	e_2	$-e_7$	−1	$-e_5$	e_6	e_3	$-e_4$	e_1
e_3	e_3	$-e_4$	e_5	−1	e_1	$-e_2$	e_7	$-e_6$
e_4	e_4	e_3	$-e_6$	$-e_1$	−1	e_7	e_2	$-e_5$
e_5	e_5	$-e_6$	$-e_3$	e_2	$-e_7$	−1	e_1	e_4
e_6	e_6	e_5	e_4	$-e_7$	$-e_2$	$-e_1$	−1	e_3
e_7	e_7	e_2	$-e_1$	e_6	e_5	$-e_4$	$-e_3$	−1

split=1

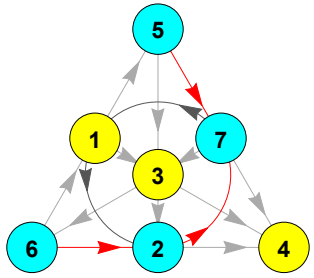
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	7	4	−3	6	−5	−2
2	−7	−1	−5	6	3	−4	1
3	−4	5	1	−1	2	−7	−6
4	3	−6	1	1	−7	−2	−5
5	−6	−3	−2	7	1	−1	4
6	5	4	7	2	1	1	3
7	2	−1	6	5	−4	−3	−1

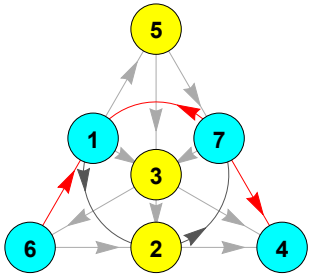
split=2

Fano plane



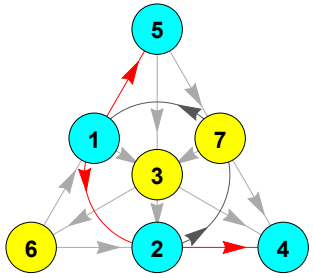
split=4

Fano plane



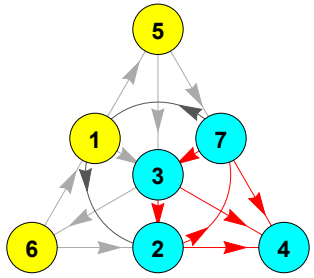
split=6

Fano plane



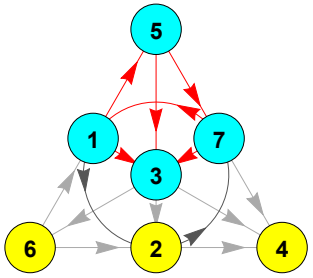
split=3

Fano plane



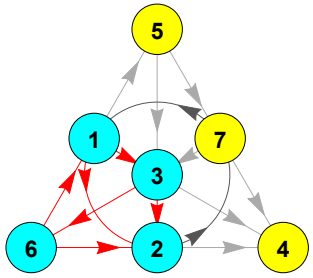
split=5

Fano plane



split=7

Fano plane

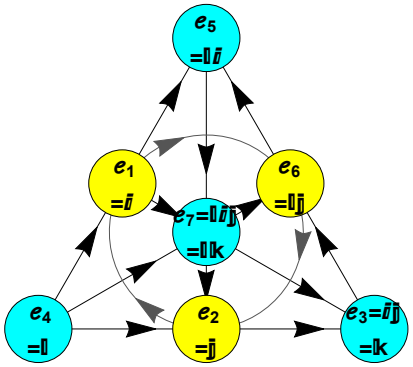


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
244	$\overline{V_1}^{0}_{w_1\ R}$		0apggsscc 011110100_2	Bn{ 0 1 1 1 0 1 1 1 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Pm}$ 61

flip=False

{1, 6, 2}{1, 7, 3}{1, 5, 4}{2, 3, 4}{2, 5, 7}{3, 6, 5}{4, 7, 6}

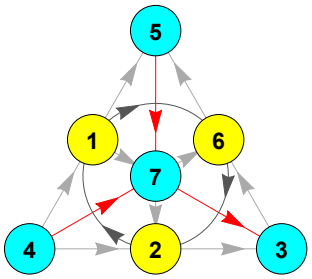
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	$-e_6$	$-e_7$	$-e_5$	e_4	e_2	e_3
e_2	e_6	−1	e_4	$-e_3$	e_7	$-e_1$	$-e_5$
e_3	e_7	$-e_4$	−1	e_2	$-e_6$	e_5	$-e_1$
e_4	e_5	e_3	$-e_2$	−1	$-e_1$	$-e_7$	e_6
e_5	$-e_4$	$-e_7$	e_6	e_1	−1	$-e_3$	e_2
e_6	$-e_2$	e_1	$-e_5$	e_7	e_3	−1	$-e_4$
e_7	$-e_3$	e_5	e_1	$-e_6$	$-e_2$	e_4	−1

split=1

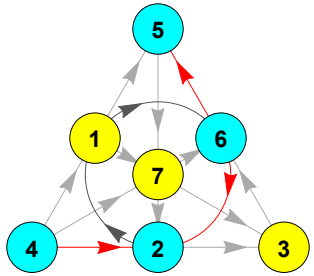
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−6	−7	−5	4	2	3
2	6	−1	4	−3	7	−1	−5
3	7	−4	1	−2	6	5	1
4	5	3	2	1	1	−7	−6
5	−4	−7	−6	−1	1	−3	−2
6	−2	1	−5	7	3	−1	−4
7	−3	5	−1	6	2	4	1

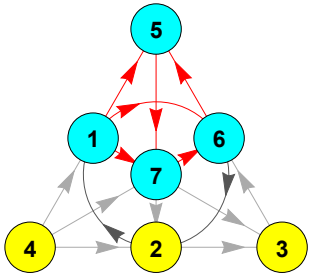
split=2

Fano plane



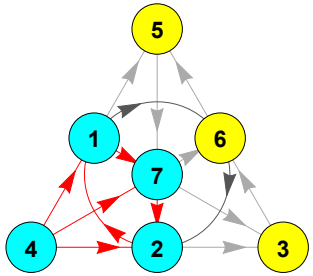
split=4

Fano plane



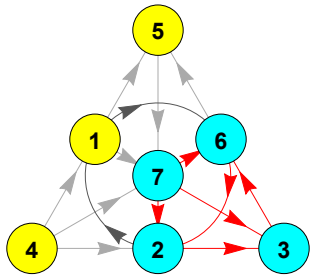
split=6

Fano plane



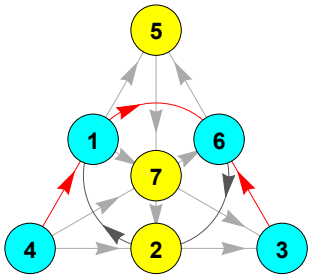
split=3

Fano plane



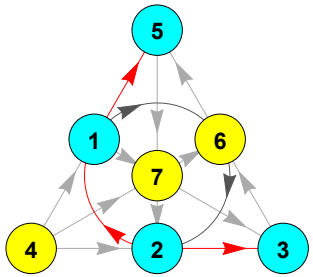
split=5

Fano plane



split=7

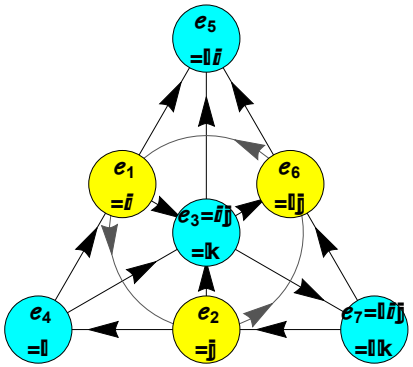
Fano plane



flip=True

{1, 2, 6}{1, 3, 7}{1, 5, 4}{2, 3, 5}{2, 4, 7}{3, 6, 4}{5, 7, 6}

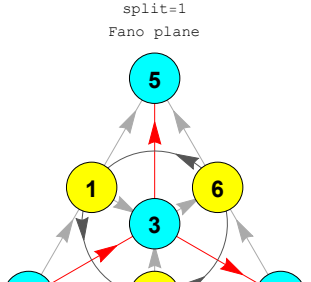
Fano plane



	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	−1	e_6	e_7	$-e_5$	e_4	$-e_2$	$-e_3$
e_2	$-e_6$	−1	e_5	e_7	$-e_3$	e_1	$-e_4$
e_3	$-e_7$	$-e_5$	−1	$-e_6$	e_2	e_4	e_1
e_4	e_5	$-e_7$	e_6	−1	$-e_1$	$-e_3$	e_2
e_5	$-e_4$	e_3	$-e_2$	e_1	−1	$-e_7$	e_6
e_6	e_2	$-e_1$	$-e_4$	e_3	e_7	−1	$-e_5$
e_7	e_3	e_4	$-e_1$	$-e_2$	$-e_6$	e_5	−1

split=1

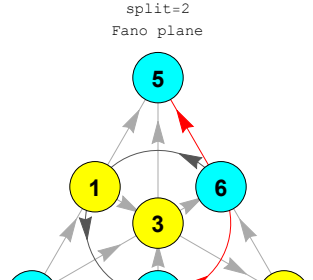
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	6	7	−5	4	−2	−3
2	−6	−1	5	7	−3	1	−4
3	−7	−5	1	6	−2	4	−1
4	5	−7	−6	1	1	−3	−2
5	−4	3	2	−1	1	−7	−6
6	2	−1	−4	3	7	−1	−5
7	3	4	1	2	6	5	1

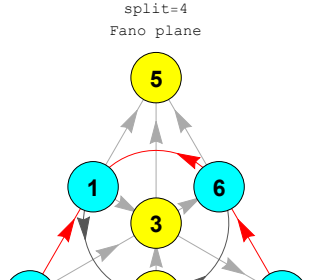
split=2

Fano plane



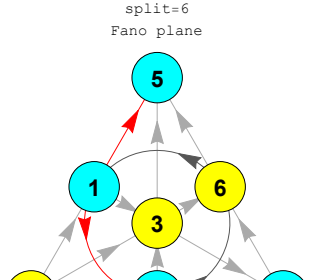
split=4

Fano plane



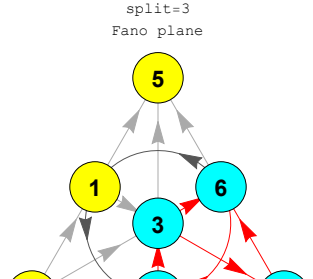
split=6

Fano plane



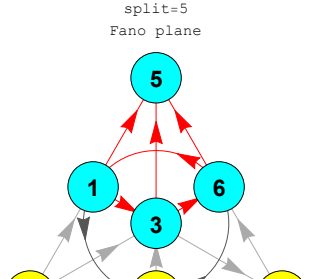
split=3

Fano plane



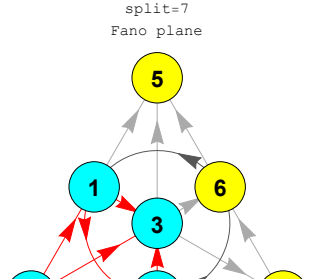
split=5

Fano plane



split=7

Fano plane

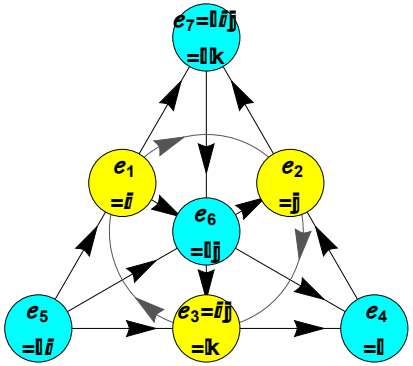


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates									Ele #
245	$\overline{e}_{ym}^{+R}$	▽	0apggsscc 010011100_2	Bn{ E8{	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0 $-\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	} }	$\overline{\text{Ho}}$ 67

flip=False

{1, 2, 3}{1, 6, 4}{1, 7, 5}{2, 7, 4}{2, 5, 6}{3, 4, 5}{3, 7, 6}

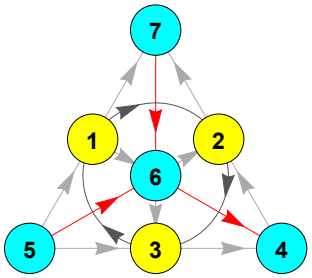
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	$-e_6$	$-e_7$	e_4	e_5
e_2	e_2	$-e_3$	−1	e_1	$-e_7$	e_6	$-e_5$	e_4
e_3	e_3	e_2	$-e_1$	−1	e_5	$-e_4$	$-e_7$	e_6
e_4	e_4	e_6	e_7	$-e_5$	−1	e_3	$-e_1$	$-e_2$
e_5	e_5	e_7	$-e_6$	e_4	$-e_3$	−1	e_2	$-e_1$
e_6	e_6	$-e_4$	e_5	e_7	e_1	$-e_2$	−1	$-e_3$
e_7	e_7	$-e_5$	$-e_4$	$-e_6$	e_2	e_1	e_3	−1

split=1

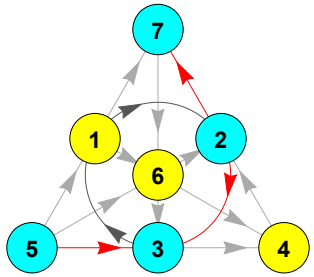
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−6	−7	4	5
2	−3	−1	1	−7	6	−5	4
3	2	−1	−1	5	−4	−7	6
4	6	7	−5	1	−3	1	2
5	7	−6	4	3	1	−2	1
6	−4	5	7	−1	2	1	3
7	−5	−4	−6	−2	−1	−3	1

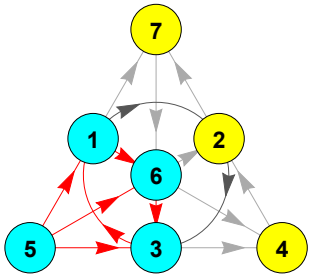
split=2

Fano plane



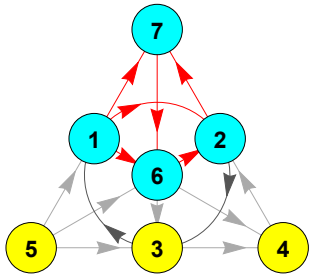
split=4

Fano plane



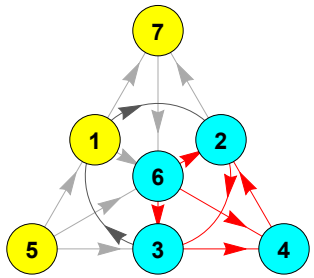
split=6

Fano plane



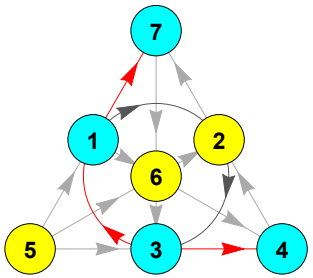
split=3

Fano plane



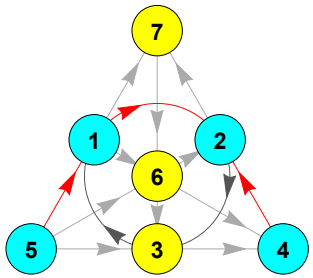
split=5

Fano plane



split=7

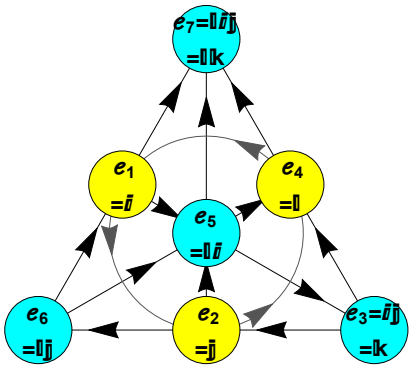
Fano plane



flip=True

{1, 2, 4}{1, 5, 3}{1, 7, 6}{2, 6, 3}{2, 5, 7}{3, 4, 7}{4, 6, 5}

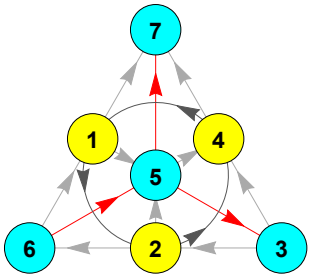
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	$-e_5$	$-e_2$	e_3	$-e_7$	e_6
e_2	e_2	$-e_4$	−1	$-e_6$	e_1	e_7	e_3	$-e_5$
e_3	e_3	e_5	e_6	−1	e_7	$-e_1$	$-e_2$	$-e_4$
e_4	e_4	e_2	$-e_1$	$-e_7$	−1	$-e_6$	e_5	e_3
e_5	e_5	$-e_3$	$-e_7$	e_1	e_6	−1	$-e_4$	e_2
e_6	e_6	e_7	$-e_3$	e_2	$-e_5$	e_4	−1	$-e_1$
e_7	e_7	$-e_6$	e_5	e_4	$-e_3$	$-e_2$	e_1	−1

split=1

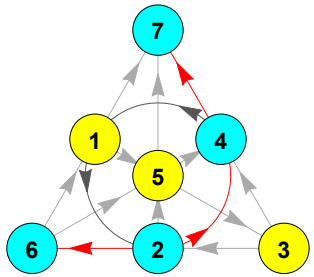
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−5	−2	3	−7	6
2	−4	−1	−6	1	7	3	−5
3	5	6	1	7	1	2	4
4	2	−1	−7	−1	−6	5	3
5	−3	−7	−1	6	1	4	−2
6	7	−3	−2	−5	−4	1	1
7	−6	5	−4	−3	2	−1	1

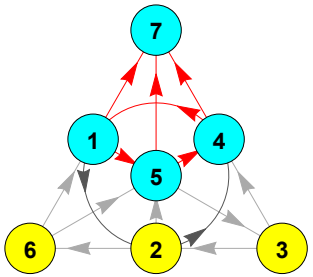
split=2

Fano plane



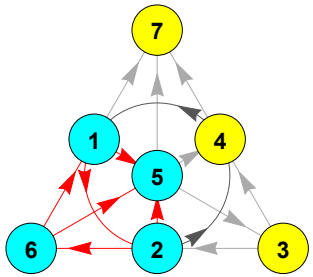
split=4

Fano plane



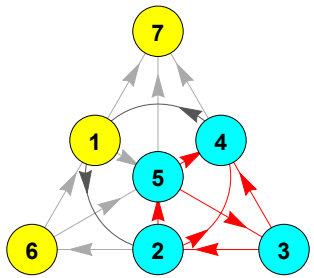
split=6

Fano plane



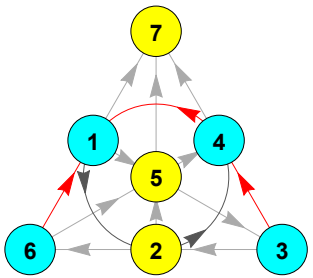
split=3

Fano plane



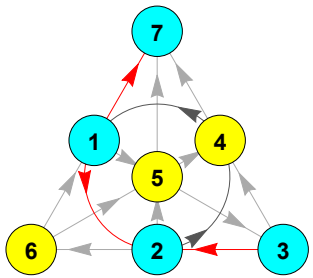
split=5

Fano plane



split=7

Fano plane

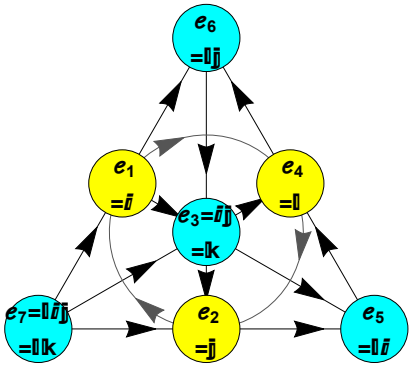


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
246	$\overline{\text{Ve}}_{\text{wm}}^{0}{}_{\text{R}}$	▽ ⬠	0apggsscc 011011100_2	Bn{ 0 1 0 1 1 1 1 1 } E8{ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{\text{Ta}}$ 73

flip=False

{1, 4, 2}{1, 3, 5}{1, 6, 7}{2, 6, 3}{3, 5, 7}{3, 4, 7}{4, 6, 5}

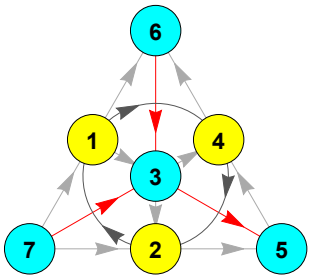
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_4$	e_5	e_2	$-e_3$	e_7	$-e_6$
e_2	e_2	e_4	−1	$-e_6$	$-e_1$	e_7	e_3	$-e_5$
e_3	e_3	$-e_5$	e_6	−1	e_7	e_1	$-e_2$	$-e_4$
e_4	e_4	$-e_2$	e_1	$-e_7$	−1	$-e_6$	e_5	e_3
e_5	e_5	e_3	$-e_7$	$-e_1$	e_6	−1	$-e_4$	e_2
e_6	e_6	$-e_7$	$-e_3$	e_2	$-e_5$	e_4	−1	e_1
e_7	e_7	e_6	e_5	e_4	$-e_3$	$-e_2$	$-e_1$	−1

split=1

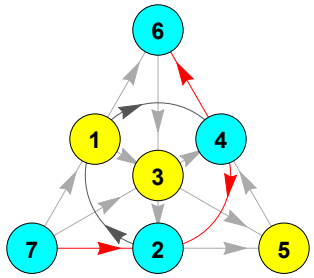
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−4	5	2	−3	7	−6
2	4	−1	−6	−1	7	3	−5
3	−5	6	1	7	−1	2	4
4	−2	1	−7	−1	−6	5	3
5	3	−7	1	6	1	4	−2
6	−7	−3	−2	−5	−4	1	−1
7	6	5	−4	−3	2	1	1

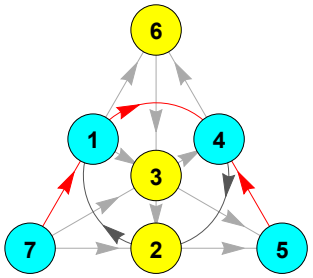
split=2

Fano plane



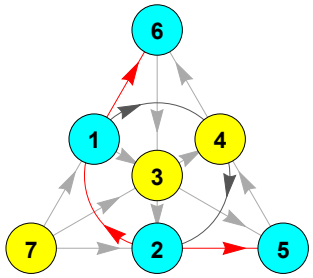
split=4

Fano plane



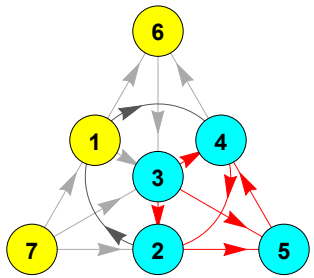
split=6

Fano plane



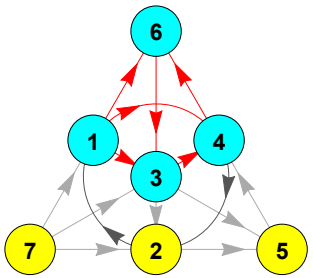
split=3

Fano plane



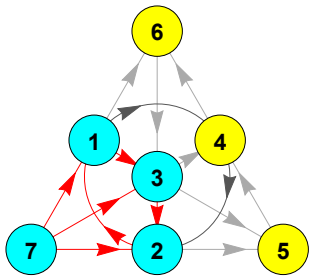
split=5

Fano plane



split=7

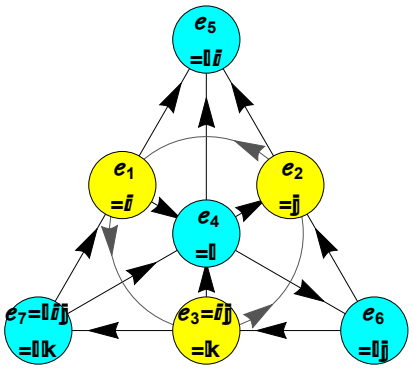
Fano plane



flip=True

{1, 3, 2}{1, 4, 6}{1, 5, 7}{2, 7, 4}{2, 5, 6}{3, 4, 5}{3, 7, 6}

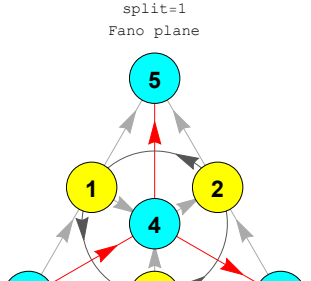
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	$-e_3$	e_2	e_6	e_7	$-e_4$	$-e_5$
e_2	e_2	e_3	−1	$-e_1$	$-e_7$	e_6	$-e_5$	e_4
e_3	e_3	$-e_2$	e_1	−1	e_5	$-e_4$	$-e_7$	e_6
e_4	e_4	$-e_6$	e_7	$-e_5$	−1	e_3	e_1	$-e_2$
e_5	e_5	$-e_7$	$-e_6$	e_4	$-e_3$	−1	e_2	e_1
e_6	e_6	e_4	e_5	e_7	$-e_1$	$-e_2$	−1	$-e_3$
e_7	e_7	e_5	$-e_4$	$-e_6$	e_2	$-e_1$	e_3	−1

split=1

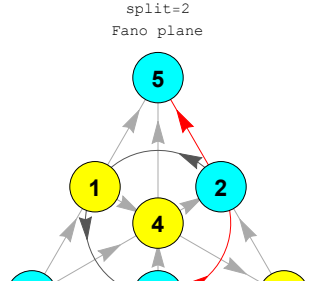
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	−3	2	6	7	−4	−5
2	3	−1	−1	−7	6	−5	4
3	−2	1	−1	5	−4	−7	6
4	−6	7	−5	1	−3	−1	2
5	−7	−6	4	3	1	−2	−1
6	4	5	7	1	2	1	3
7	5	−4	−6	−2	1	−3	1

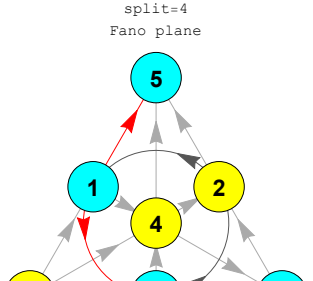
split=2

Fano plane



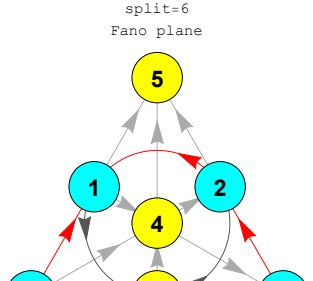
split=4

Fano plane



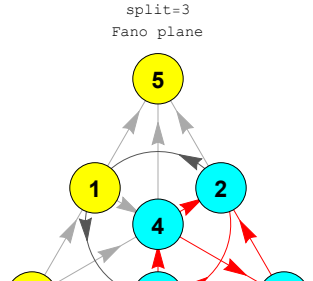
split=6

Fano plane



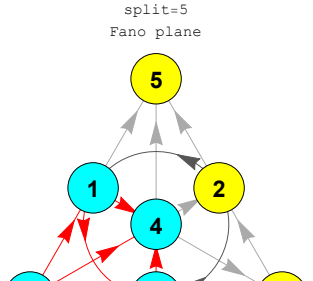
split=3

Fano plane



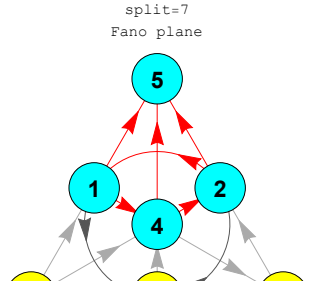
split=5

Fano plane



split=7

Fano plane

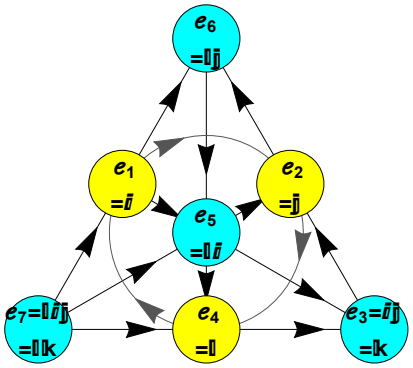


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
247	$\overline{V_e}^{0}_{w_d}$	▼ ⬢	0apggsscc 011010000_2	Bn{ 0 0 1 1 1 1 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Au}$ 79

flip=False

{1, 2, 4}{1, 5, 3}{1, 6, 7}{2, 6, 3}{2, 7, 5}{3, 7, 4}{4, 6, 5}

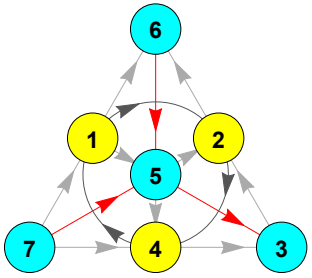
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_4	$-e_5$	$-e_2$	e_3	e_7	$-e_6$
e_2	e_2	$-e_4$	−1	$-e_6$	e_1	$-e_7$	e_3	e_5
e_3	e_3	e_5	e_6	−1	$-e_7$	$-e_1$	$-e_2$	e_4
e_4	e_4	e_2	$-e_1$	e_7	−1	$-e_6$	e_5	$-e_3$
e_5	e_5	$-e_3$	e_7	e_1	e_6	−1	$-e_4$	$-e_2$
e_6	e_6	$-e_7$	$-e_3$	e_2	$-e_5$	e_4	−1	e_1
e_7	e_7	e_6	$-e_5$	$-e_4$	e_3	e_2	$-e_1$	−1

split=1

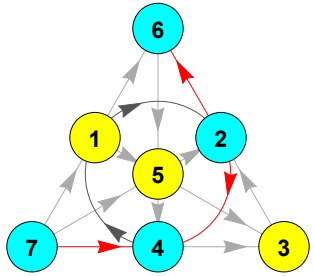
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	4	−5	−2	3	7	−6
2	−4	−1	−6	1	−7	3	5
3	5	6	1	−7	1	2	−4
4	2	−1	7	−1	−6	5	−3
5	−3	7	−1	6	1	4	2
6	−7	−3	−2	−5	−4	1	−1
7	6	−5	4	3	−2	1	1

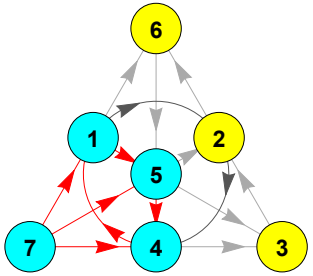
split=2

Fano plane



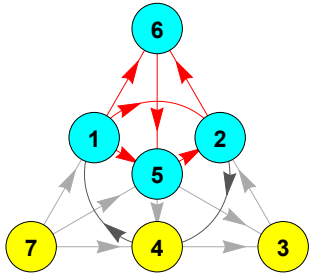
split=4

Fano plane



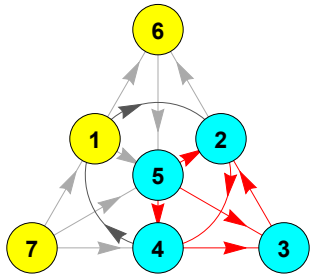
split=6

Fano plane



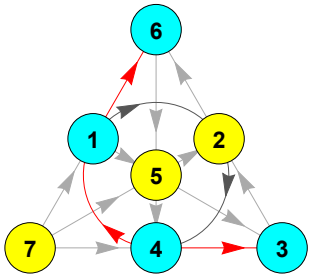
split=3

Fano plane



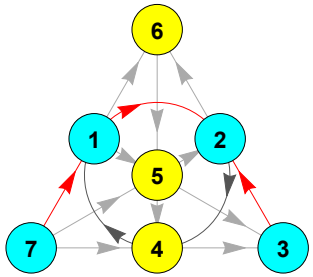
split=5

Fano plane



split=7

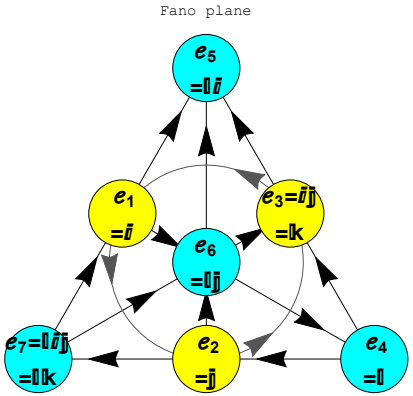
Fano plane



flip=True

{1, 2, 3}{1, 6, 4}{1, 5, 7}{2, 7, 4}{2, 6, 5}{3, 5, 4}{3, 7, 6}

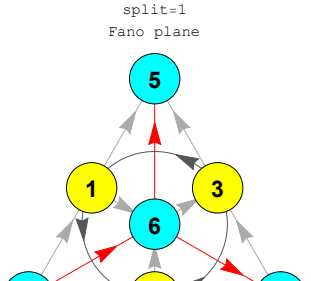
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	−1	e_3	$-e_2$	$-e_6$	e_7	e_4	$-e_5$
e_2	e_2	$-e_3$	−1	e_1	$-e_7$	$-e_6$	e_5	e_4
e_3	e_3	e_2	$-e_1$	−1	$-e_5$	e_4	$-e_7$	e_6
e_4	e_4	e_6	e_7	e_5	−1	$-e_3$	$-e_1$	$-e_2$
e_5	e_5	$-e_7$	e_6	$-e_4$	e_3	−1	$-e_2$	e_1
e_6	e_6	$-e_4$	$-e_5$	e_7	e_1	e_2	−1	$-e_3$
e_7	e_7	e_5	$-e_4$	$-e_6$	e_2	$-e_1$	e_3	−1

split=1

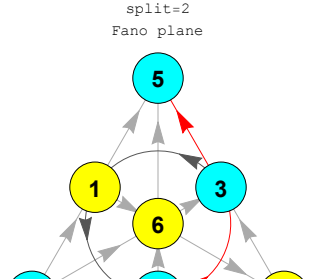
Fano plane



0↦1	1	2	3	4	5	6	7
1	−1	3	−2	−6	7	4	−5
2	−3	−1	1	−7	−6	5	4
3	2	−1	−1	−5	4	−7	6
4	6	7	5	1	3	1	2
5	−7	6	−4	−3	1	2	−1
6	−4	−5	7	−1	−2	1	3
7	5	−4	−6	−2	1	−3	1

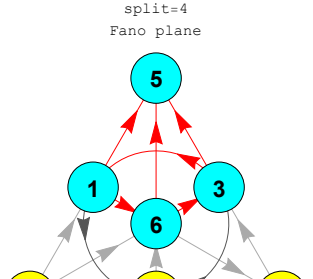
split=2

Fano plane



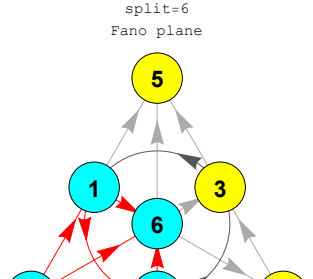
split=4

Fano plane



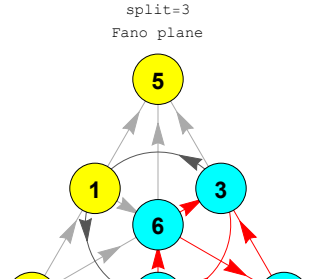
split=6

Fano plane



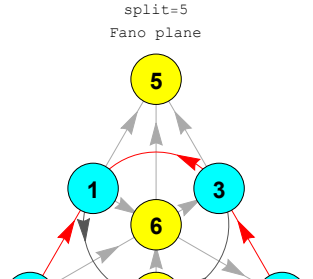
split=3

Fano plane



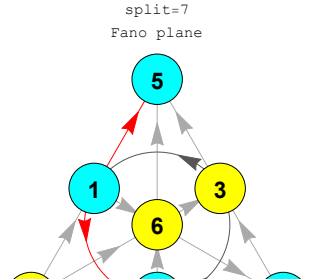
split=5

Fano plane



split=7

Fano plane

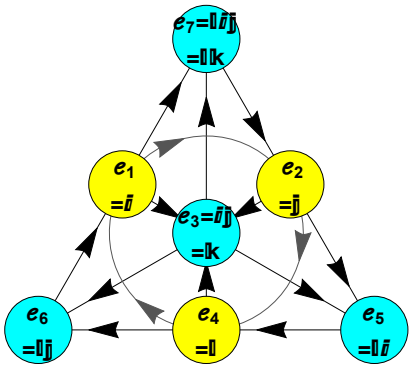


Seq #	Symbol	2D/3D Shape	Particle Quantum Bits	Binary / E8 Coordinates	Ele #
256	$\overline{\underset{w_1}{Ve}}^{0}_{R}$		0apggsscc 011010100_2	Bn{ 1 1 1 1 1 1 1 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ }	$\overline{Be}$ 4

flip=False

{1, 2, 4}{1, 3, 5}{1, 7, 6}{2, 3, 6}{2, 5, 7}{3, 7, 4}{4, 6, 5}

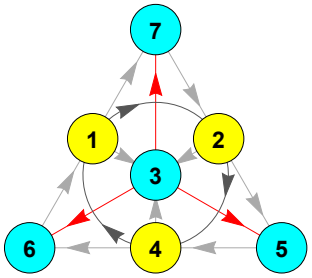
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_4	e_5	$-e_2$	$-e_3$	$-e_7$	e_6
e_2	e_2	$-e_4$	-1	e_6	e_1	e_7	$-e_3$	$-e_5$
e_3	e_3	$-e_5$	$-e_6$	-1	$-e_7$	e_1	e_2	e_4
e_4	e_4	e_2	$-e_1$	e_7	-1	$-e_6$	e_5	$-e_3$
e_5	e_5	e_3	$-e_7$	$-e_1$	e_6	-1	$-e_4$	e_2
e_6	e_6	e_7	e_3	$-e_2$	$-e_5$	e_4	-1	$-e_1$
e_7	e_7	$-e_6$	e_5	$-e_4$	e_3	$-e_2$	e_1	-1

split=1

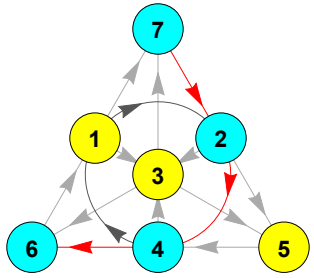
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	4	5	-2	-3	-7	6
2	-4	-1	6	1	7	-3	-5
3	-5	-6	1	-7	-1	-2	-4
4	2	-1	7	-1	-6	5	-3
5	3	-7	1	6	1	4	-2
6	7	3	2	-5	-4	1	1
7	-6	5	4	3	2	-1	1

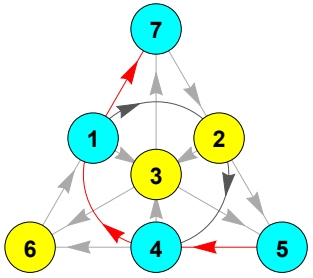
split=2

Fano plane



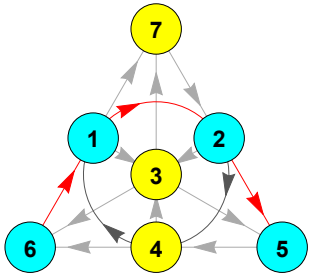
split=4

Fano plane



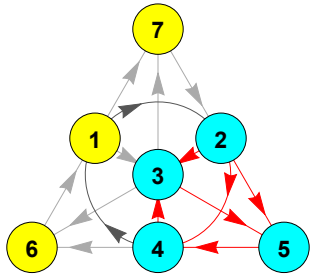
split=6

Fano plane



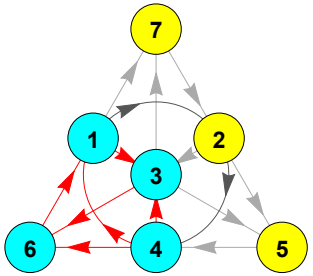
split=3

Fano plane



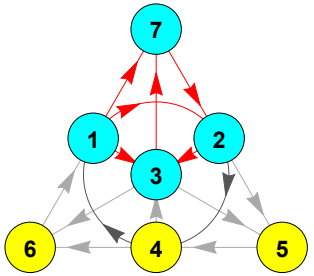
split=5

Fano plane



split=7

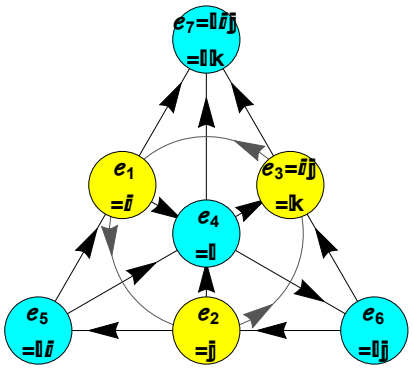
Fano plane



flip=True

{1, 2, 3}{1, 4, 6}{1, 7, 5}{2, 4, 7}{2, 5, 6}{3, 5, 4}{3, 7, 6}

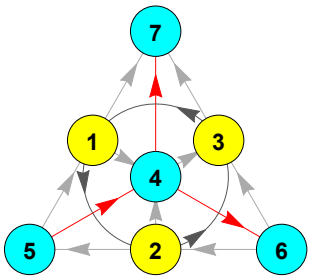
Fano plane



	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
1	1	e_1	e_2	e_3	e_4	e_5	e_6	e_7
e_1	e_1	-1	e_3	$-e_2$	e_6	$-e_7$	$-e_4$	e_5
e_2	e_2	$-e_3$	-1	e_1	e_7	e_6	$-e_5$	$-e_4$
e_3	e_3	e_2	$-e_1$	-1	$-e_5$	e_4	$-e_7$	e_6
e_4	e_4	$-e_6$	$-e_7$	e_5	-1	$-e_3$	e_1	e_2
e_5	e_5	e_7	$-e_6$	$-e_4$	e_3	-1	e_2	$-e_1$
e_6	e_6	e_4	e_5	e_7	$-e_1$	$-e_2$	-1	$-e_3$
e_7	e_7	$-e_5$	e_4	$-e_6$	$-e_2$	e_1	e_3	-1

split=1

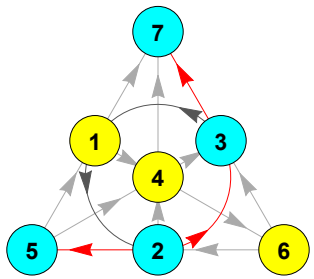
Fano plane



0↦1	1	2	3	4	5	6	7
1	-1	3	-2	6	-7	-4	5
2	-3	-1	1	7	6	-5	-4
3	2	-1	-1	-5	4	-7	6
4	-6	-7	5	1	3	-1	-2
5	7	-6	-4	-3	1	-2	1
6	4	5	7	1	2	1	3
7	-5	4	-6	2	-1	-3	1

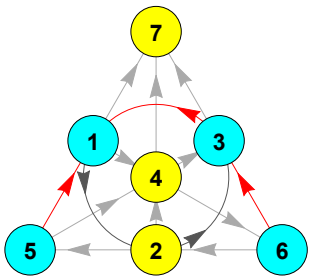
split=2

Fano plane



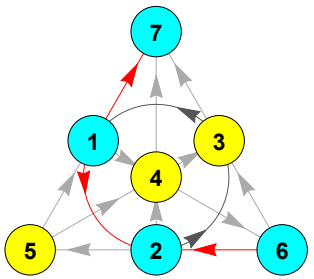
split=4

Fano plane



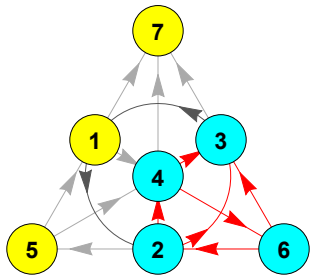
split=6

Fano plane



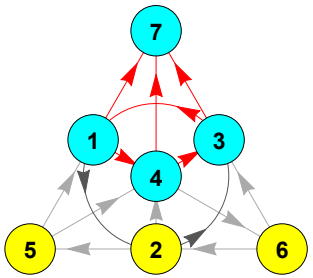
split=3

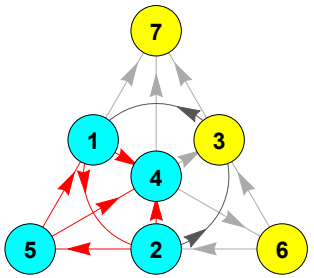
Fano plane



split=5

Fano plane



split=7

Fano plane