Rank-35 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

$$X_2^3 + X_0^2 X_1 = 0$$

(0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
The point rank of the equation over GF(32) is 34865

General information

Number of lines	33
Number of points	1057
Number of singular points	33
Number of Eckardt points	0
Number of double points	0
Number of single points	1056
Number of points off lines	0
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33^{33}
Type of lines on points	33, 1^{1056}

Singular Points

The surface has 33 singular points:

0 : $P_1 = \mathbf{P}(0,1,0,0) = \mathbf{P}(0,1,0,0)$
1 : $P_3 = \mathbf{P}(0,0,0,1) = \mathbf{P}(0,0,0,1)$
2 : $P_{1090} = \mathbf{P}(0,1,0,1) = \mathbf{P}(0,1,0,1)$
3 : $P_{1122} = \mathbf{P}(0,\eta,0,1) = \mathbf{P}(0,2,0,1)$
4 : $P_{1154} = \mathbf{P}(0,\eta^{18},0,1) = \mathbf{P}(0,3,0,1)$
5 : $P_{1186} = \mathbf{P}(0,\eta^{2},0,1) = \mathbf{P}(0,4,0,1)$
6 : $P_{1218} = \mathbf{P}(0,\eta^{5},0,1) = \mathbf{P}(0,5,0,1)$
7 : $P_{1250} = \mathbf{P}(0,\eta^{19},0,1) = \mathbf{P}(0,6,0,1)$
8 : $P_{1282} = \mathbf{P}(0,\eta^{11},0,1) = \mathbf{P}(0,7,0,1)$
9 : $P_{1314} = \mathbf{P}(0,\eta^{3},0,1) = \mathbf{P}(0,8,0,1)$
10 : $P_{1346} = \mathbf{P}(0,\eta^{29},0,1) = \mathbf{P}(0,9,0,1)$
11 : $P_{1378} = \mathbf{P}(0,\eta^{6},0,1) = \mathbf{P}(0,10,0,1)$
12 : $P_{1410} = \mathbf{P}(0,\eta^{27},0,1) = \mathbf{P}(0,11,0,1)$
13 : $P_{1442} = \mathbf{P}(0,\eta^{20},0,1) = \mathbf{P}(0,12,0,1)$
14 : $P_{1474} = \mathbf{P}(0,\eta^{8},0,1) = \mathbf{P}(0,13,0,1)$
15 : $P_{1506} = \mathbf{P}(0,\eta^{12},0,1) = \mathbf{P}(0,14,0,1)$
16 : $P_{1538} = \mathbf{P}(0,\eta^{23},0,1) = \mathbf{P}(0,15,0,1)$
17 : $P_{1570} = \mathbf{P}(0,\eta^{4},0,1) = \mathbf{P}(0,16,0,1)$

$18: P_{1602} = \mathbf{P}(0, \eta^{10}, 0, 1) = \mathbf{P}(0, 17, 0, 1)$
$19: P_{1634} = \mathbf{P}(0, \eta^{30}, 0, 1) = \mathbf{P}(0, 18, 0, 1)$
$20: P_{1666} = \mathbf{P}(0, \eta^{17}, 0, 1) = \mathbf{P}(0, 19, 0, 1)$
$21: P_{1698} = \mathbf{P}(0, \eta^{7}, 0, 1) = \mathbf{P}(0, 20, 0, 1)$
$22: P_{1730} = \mathbf{P}(0, \eta^{22}, 0, 1) = \mathbf{P}(0, 21, 0, 1)$
$23: P_{1762} = \mathbf{P}(0, \eta^{28}, 0, 1) = \mathbf{P}(0, 22, 0, 1)$
$24: P_{1794} = \mathbf{P}(0, \eta^{26}, 0, 1) = \mathbf{P}(0, 23, 0, 1)$
$25: P_{1826} = \mathbf{P}(0, \eta^{21}, 0, 1) = \mathbf{P}(0, 24, 0, 1)$
$26: P_{1858} = \mathbf{P}(0, \eta^{25}, 0, 1) = \mathbf{P}(0, 25, 0, 1)$
$27: P_{1890} = \mathbf{P}(0, \eta^{9}, 0, 1) = \mathbf{P}(0, 26, 0, 1)$
$28: P_{1922} = \mathbf{P}(0, \eta^{16}, 0, 1) = \mathbf{P}(0, 27, 0, 1)$
$29: P_{1954} = \mathbf{P}(0, \eta^{13}, 0, 1) = \mathbf{P}(0, 28, 0, 1)$
$30: P_{1986} = \mathbf{P}(0, \eta^{14}, 0, 1) = \mathbf{P}(0, 29, 0, 1)$
$31: P_{2018} = \mathbf{P}(0, \eta^{24}, 0, 1) = \mathbf{P}(0, 30, 0, 1)$
$32: P_{2050} = \mathbf{P}(0, \eta^{15}, 0, 1) = \mathbf{P}(0, 31, 0, 1)$

The 33 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1056} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1056} = \mathbf{Pl}(0,0,0,0,1,0)_{1089}$$

$$\ell_1 = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082400} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082400} = \mathbf{Pl}(0,0,0,1,0,0)_{65}$$

$$\ell_2 = \begin{bmatrix} 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{35937} = \begin{bmatrix} 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{35937} = \mathbf{Pl}(0,1,0,1,1,0)_{3137}$$

$$\ell_3 = \begin{bmatrix} 1 & \eta^{17} & \eta^{16} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{934387} = \begin{bmatrix} 1 & 19 & 27 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{934387} = \mathbf{Pl}(0,27,0,19,1,0)_{4297}$$

$$\ell_4 = \begin{bmatrix} 1 & \eta^{27} & \eta^{9} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{892107} = \begin{bmatrix} 1 & 11 & 26 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{892107} = \mathbf{Pl}(0,26,0,11,1,0)_{3792}$$

$$\ell_5 = \begin{bmatrix} 1 & \eta^{3} & \eta & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{77160} = \begin{bmatrix} 1 & 8 & 2 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{77160} = \mathbf{Pl}(0,2,0,8,1,0)_{3579}$$

$$\ell_6 = \begin{bmatrix} 1 & \eta^{23} & \eta^{18} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{118383} = \begin{bmatrix} 1 & 15 & 3 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{118383} = \mathbf{Pl}(0,3,0,15,1,0)_{4021}$$

$$\ell_7 = \begin{bmatrix} 1 & \eta^{13} & \eta^{25} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{876252} = \begin{bmatrix} 1 & 28 & 25 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{876252} = \mathbf{Pl}(0,25,0,28,1,0)_{4862}$$

$$\ell_8 = \begin{bmatrix} 1 & \eta & \eta^{21} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{814946} = \begin{bmatrix} 1 & 2 & 24 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{814946} = \mathbf{Pl}(0,24,0,2,1,0)_{3223}$$

$$\ell_9 = \begin{bmatrix} 1 & \eta^{20} & \eta^{17} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{656396} = \begin{bmatrix} 1 & 12 & 19 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{656396} = \mathbf{Pl}(0,19,0,12,1,0)_{3848}$$

$$\ell_{10} = \begin{bmatrix} 1 & \eta^{28} & \eta^{30} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{633142} = \begin{bmatrix} 1 & 22 & 18 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{633142} = \mathbf{Pl}(0,18,0,22,1,0)_{4477}$$

$$\ell_{11} = \begin{bmatrix} 1 & \eta^{9} & \eta^{3} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{299130} = \begin{bmatrix} 1 & 26 & 8 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{299130} = \mathbf{Pl}(0,8,0,26,1,0)_{4719}$$

$$\ell_{12} = \begin{bmatrix} 1 & \eta^{25} & \eta^{29} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{331897} = \begin{bmatrix} 1 & 25 & 9 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{331897} = \mathbf{Pl}(0,9,0,25,1,0)_{4657}$$

$$\ell_{13} = \begin{bmatrix} 1 & \eta^{30} & \eta^{10} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{595090} = \begin{bmatrix} 1 & 18 & 17 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{595090} = \mathbf{Pl}(0,17,0,18,1,0)_{4224}$$

$$\ell_{14} = \begin{bmatrix} 1 & \eta^{12} & \eta^{4} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{557038} = \begin{bmatrix} 1 & 14 & 16 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{557038} = \mathbf{Pl}(0,16,0,14,1,0)_{3971}$$

$$\ell_{15} = \begin{bmatrix} 1 & \eta^{18} & \eta^{6} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{342467} = \begin{bmatrix} 1 & 3 & 10 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{342467} = \mathbf{Pl}(0,10,0,3,1,0)_{3272}$$

$$\ell_{16} = \begin{bmatrix} 1 & \eta^{19} & \eta^{27} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{379462} = \begin{bmatrix} 1 & 6 & 11 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{379462} = \mathbf{Pl}(0,11,0,6,1,0)_{3462}$$

$$\ell_{17} = \begin{bmatrix} 1 & \eta^{6} & \eta^{2} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{146922} = \begin{bmatrix} 1 & 10 & 4 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{146922} = \mathbf{Pl}(0,4,0,10,1,0)_{3707}$$

$$\ell_{18} = \begin{bmatrix} 1 & \eta^{15} & \eta^{5} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{202943} = \begin{bmatrix} 1 & 31 & 5 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{202943} = \mathbf{Pl}(0,5,0,31,1,0)_{5031}$$

$$\ell_{19} = \begin{bmatrix} 1 & \eta^{14} & \eta^{15} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1080253} = \begin{bmatrix} 1 & 29 & 31 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1080253} = \mathbf{Pl}(0,31,0,29,1,0)_{4931}$$

$$\ell_{20} = \begin{bmatrix} 1 & \eta^{10} & \eta^{24} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1033745} = \begin{bmatrix} 1 & 17 & 30 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1033745} = \mathbf{Pl}(0,30,0,17,1,0)_{4174}$$

$$\ell_{21} = \begin{bmatrix} 1 & \eta^{26} & \eta^{19} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{228311} = \begin{bmatrix} 1 & 23 & 6 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{228311} = \mathbf{Pl}(0,6,0,23,1,0)_{4528}$$

$$\ell_{22} = \begin{bmatrix} 1 & \eta^{2} & \eta^{11} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{242052} = \begin{bmatrix} 1 & 4 & 7 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{242052} = \mathbf{Pl}(0,7,0,4,1,0)_{3332}$$

$$\ell_{23} = \begin{bmatrix} 1 & \eta^{11} & \eta^{14} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{989351} = \begin{bmatrix} 1 & 7 & 29 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{989351} = \mathbf{Pl}(0,29,0,7,1,0)_{3543}$$

$$\ell_{24} = \begin{bmatrix} 1 & \eta^{8} & \eta^{13} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{961869} = \begin{bmatrix} 1 & 13 & 28 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{961869} = \mathbf{Pl}(0,28,0,13,1,0)_{3920}$$

$$\ell_{25} = \begin{bmatrix} 1 & \eta^{16} & \eta^{26} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{807547} = \begin{bmatrix} 1 & 27 & 23 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{807547} = \mathbf{Pl}(0,23,0,27,1,0)_{4797}$$

$$\ell_{26} = \begin{bmatrix} 1 & \eta^{22} & \eta^{28} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{767381} = \begin{bmatrix} 1 & 21 & 22 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{767381} = \mathbf{Pl}(0,22,0,21,1,0)_{4418}$$

$$\ell_{27} = \begin{bmatrix} 1 & \eta^{29} & \eta^{20} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{416457} = \begin{bmatrix} 1 & 9 & 12 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{416457} = \mathbf{Pl}(0,12,0,9,1,0)_{3652}$$

$$\ell_{28} = \begin{bmatrix} 1 & \eta^{24} & \eta^{8} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{472478} = \begin{bmatrix} 1 & 30 & 13 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{472478} = \mathbf{Pl}(0,13,0,30,1,0)_{4976}$$

$$\ell_{29} = \begin{bmatrix} 1 & \eta^{4} & \eta^{22} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{728272} = \begin{bmatrix} 1 & 16 & 21 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{728272} = \mathbf{Pl}(0,21,0,16,1,0)_{4102}$$

$$\ell_{30} = \begin{bmatrix} 1 & \eta^{21} & \eta^{7} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{702904} = \begin{bmatrix} 1 & 24 & 20 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{702904} = \mathbf{Pl}(0,20,0,24,1,0)_{4605}$$

$$\ell_{31} = \begin{bmatrix} 1 & \eta^{5} & \eta^{12} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{479877} = \begin{bmatrix} 1 & 5 & 14 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{479877} = \mathbf{Pl}(0,14,0,5,1,0)_{3402}$$

$$\ell_{32} = \begin{bmatrix} 1 & \eta^{7} & \eta^{23} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{529556} = \begin{bmatrix} 1 & 20 & 15 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{529556} = \mathbf{Pl}(0,15,0,20,1,0)_{4348}$$

Rank of lines: (1056, 1082400, 35937, 934387, 892107, 77160, 118383, 876252, 814946, 656396, 633142, 299130, 331897, 595090, 557038, 342467, 379462, 146922, 202943, 1080253, 1033745, 228311, 242052, 989351, 961869, 807547, 767381, 416457, 472478, 728272, 702904, 479877, 529556)
Rank of points on Klein quadric: (1089, 65, 3137, 4297, 3792, 3579, 4021, 4862, 3223, 3848, 4477, 4719, 4657, 4224, 3971, 3272, 3462, 3707, 5031, 4931, 4174, 4528, 3332, 3543, 3920, 4797, 4418, 3652, 4976, 4102, 4605, 3402, 4348)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 0 Double points:
The double points on the surface are:

Single Points

The surface has 1056 single points:
Too many to print.

Points on surface but on no line

The surface has 0 points not on any line:
The points on the surface but not on lines are:

Line Intersection Graph

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
32	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 3 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 4 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 5 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 6 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 7 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 8 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 9 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 10 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 11 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 12 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 13 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 14 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 15 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 16 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	

Line 17 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 18 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 19 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{20}	ℓ_{21}	ℓ_{22}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 20 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{21}	ℓ_{22}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 21 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{22}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 22 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 23 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 24 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 25 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 26 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 27 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 28 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 29 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P

Line 30 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3

Line 31 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3

Line 32 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ
in point	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3	P_3

The surface has 1057 points:
Too many to print.