Rank-65547 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

$$X_3^3 + X_0X_1X_2 = 0$$

(0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is 1108411429

General information

Number of lines	3
Number of points	1057
Number of singular points	3
Number of Eckardt points	0
Number of double points	3
Number of single points	93
Number of points off lines	961
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33^3
Type of lines on points	2^3, 1^{93}, 0^{961}

Singular Points

The surface has 3 singular points:

$0: P_0 = \mathbf{P}(1,0,0,0) = \mathbf{P}(1,0,0,0)$
$1: P_1 = \mathbf{P}(0,1,0,0) = \mathbf{P}(0,1,0,0)$
$2: P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$

The 3 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_0 = \mathbf{Pl}(1,0,0,0,0,0)_0$$

$$\ell_1 = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{1024} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{1024} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

$$\ell_2 = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{1082368} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{1082368} = \mathbf{Pl}(0,0,0,0,0,1)_{34849}$$

Rank of lines: (0, 1024, 1082368)
Rank of points on Klein quadric: (0, 2, 34849)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 3 Double points:
The double points on the surface are:

$P_0 = (1,0,0,0) = \ell_0 \cap \ell_1$
$P_1 = (0,1,0,0) = \ell_0 \cap \ell_2$
$P_2 = (0,0,1,0) = \ell_1 \cap \ell_2$

Single Points

The surface has 93 single points:
The single points on the surface are:

0 : $P_5 = (1,1,0,0)$ lies on line ℓ_0
1 : $P_6 = (2,1,0,0)$ lies on line ℓ_0
2 : $P_7 = (3,1,0,0)$ lies on line ℓ_0
3 : $P_8 = (4,1,0,0)$ lies on line ℓ_0
4 : $P_9 = (5,1,0,0)$ lies on line ℓ_0
5 : $P_{10} = (6,1,0,0)$ lies on line ℓ_0
6 : $P_{11} = (7,1,0,0)$ lies on line ℓ_0
7 : $P_{12} = (8,1,0,0)$ lies on line ℓ_0
8 : $P_{13} = (9,1,0,0)$ lies on line ℓ_0
9 : $P_{14} = (10,1,0,0)$ lies on line ℓ_0
10 : $P_{15} = (11,1,0,0)$ lies on line ℓ_0
11 : $P_{16} = (12,1,0,0)$ lies on line ℓ_0
12 : $P_{17} = (13,1,0,0)$ lies on line ℓ_0
13 : $P_{18} = (14,1,0,0)$ lies on line ℓ_0
14 : $P_{19} = (15,1,0,0)$ lies on line ℓ_0
15 : $P_{20} = (16,1,0,0)$ lies on line ℓ_0
16 : $P_{21} = (17,1,0,0)$ lies on line ℓ_0
17 : $P_{22} = (18,1,0,0)$ lies on line ℓ_0
18 : $P_{23} = (19,1,0,0)$ lies on line ℓ_0
19 : $P_{24} = (20,1,0,0)$ lies on line ℓ_0
20 : $P_{25} = (21,1,0,0)$ lies on line ℓ_0
21 : $P_{26} = (22,1,0,0)$ lies on line ℓ_0
22 : $P_{27} = (23,1,0,0)$ lies on line ℓ_0
23 : $P_{28} = (24,1,0,0)$ lies on line ℓ_0
24 : $P_{29} = (25,1,0,0)$ lies on line ℓ_0
25 : $P_{30} = (26,1,0,0)$ lies on line ℓ_0
26 : $P_{31} = (27,1,0,0)$ lies on line ℓ_0
27 : $P_{32} = (28,1,0,0)$ lies on line ℓ_0
28 : $P_{33} = (29,1,0,0)$ lies on line ℓ_0
29 : $P_{34} = (30,1,0,0)$ lies on line ℓ_0
30 : $P_{35} = (31,1,0,0)$ lies on line ℓ_0
31 : $P_{36} = (1,0,1,0)$ lies on line ℓ_1
32 : $P_{37} = (2,0,1,0)$ lies on line ℓ_1
33 : $P_{38} = (3,0,1,0)$ lies on line ℓ_1
34 : $P_{39} = (4,0,1,0)$ lies on line ℓ_1
35 : $P_{40} = (5,0,1,0)$ lies on line ℓ_1
36 : $P_{41} = (6,0,1,0)$ lies on line ℓ_1
37 : $P_{42} = (7,0,1,0)$ lies on line ℓ_1
38 : $P_{43} = (8,0,1,0)$ lies on line ℓ_1
39 : $P_{44} = (9,0,1,0)$ lies on line ℓ_1
40 : $P_{45} = (10,0,1,0)$ lies on line ℓ_1
41 : $P_{46} = (11,0,1,0)$ lies on line ℓ_1
42 : $P_{47} = (12,0,1,0)$ lies on line ℓ_1
43 : $P_{48} = (13,0,1,0)$ lies on line ℓ_1
44 : $P_{49} = (14,0,1,0)$ lies on line ℓ_1
45 : $P_{50} = (15,0,1,0)$ lies on line ℓ_1
46 : $P_{51} = (16,0,1,0)$ lies on line ℓ_1
47 : $P_{52} = (17,0,1,0)$ lies on line ℓ_1
48 : $P_{53} = (18,0,1,0)$ lies on line ℓ_1
49 : $P_{54} = (19,0,1,0)$ lies on line ℓ_1
50 : $P_{55} = (20,0,1,0)$ lies on line ℓ_1
51 : $P_{56} = (21,0,1,0)$ lies on line ℓ_1

52 : $P_{57} = (22, 0, 1, 0)$ lies on line ℓ_1
53 : $P_{58} = (23, 0, 1, 0)$ lies on line ℓ_1
54 : $P_{59} = (24, 0, 1, 0)$ lies on line ℓ_1
55 : $P_{60} = (25, 0, 1, 0)$ lies on line ℓ_1
56 : $P_{61} = (26, 0, 1, 0)$ lies on line ℓ_1
57 : $P_{62} = (27, 0, 1, 0)$ lies on line ℓ_1
58 : $P_{63} = (28, 0, 1, 0)$ lies on line ℓ_1
59 : $P_{64} = (29, 0, 1, 0)$ lies on line ℓ_1
60 : $P_{65} = (30, 0, 1, 0)$ lies on line ℓ_1
61 : $P_{66} = (31, 0, 1, 0)$ lies on line ℓ_1
62 : $P_{67} = (0, 1, 1, 0)$ lies on line ℓ_2
63 : $P_{99} = (0, 2, 1, 0)$ lies on line ℓ_2
64 : $P_{131} = (0, 3, 1, 0)$ lies on line ℓ_2
65 : $P_{163} = (0, 4, 1, 0)$ lies on line ℓ_2
66 : $P_{195} = (0, 5, 1, 0)$ lies on line ℓ_2
67 : $P_{227} = (0, 6, 1, 0)$ lies on line ℓ_2
68 : $P_{259} = (0, 7, 1, 0)$ lies on line ℓ_2
69 : $P_{291} = (0, 8, 1, 0)$ lies on line ℓ_2
70 : $P_{323} = (0, 9, 1, 0)$ lies on line ℓ_2
71 : $P_{355} = (0, 10, 1, 0)$ lies on line ℓ_2
72 : $P_{387} = (0, 11, 1, 0)$ lies on line ℓ_2
73 : $P_{419} = (0, 12, 1, 0)$ lies on line ℓ_2
74 : $P_{451} = (0, 13, 1, 0)$ lies on line ℓ_2
75 : $P_{483} = (0, 14, 1, 0)$ lies on line ℓ_2
76 : $P_{515} = (0, 15, 1, 0)$ lies on line ℓ_2
77 : $P_{547} = (0, 16, 1, 0)$ lies on line ℓ_2
78 : $P_{579} = (0, 17, 1, 0)$ lies on line ℓ_2
79 : $P_{611} = (0, 18, 1, 0)$ lies on line ℓ_2
80 : $P_{643} = (0, 19, 1, 0)$ lies on line ℓ_2
81 : $P_{675} = (0, 20, 1, 0)$ lies on line ℓ_2
82 : $P_{707} = (0, 21, 1, 0)$ lies on line ℓ_2
83 : $P_{739} = (0, 22, 1, 0)$ lies on line ℓ_2
84 : $P_{771} = (0, 23, 1, 0)$ lies on line ℓ_2
85 : $P_{803} = (0, 24, 1, 0)$ lies on line ℓ_2
86 : $P_{835} = (0, 25, 1, 0)$ lies on line ℓ_2
87 : $P_{867} = (0, 26, 1, 0)$ lies on line ℓ_2
88 : $P_{899} = (0, 27, 1, 0)$ lies on line ℓ_2
89 : $P_{931} = (0, 28, 1, 0)$ lies on line ℓ_2
90 : $P_{963} = (0, 29, 1, 0)$ lies on line ℓ_2
91 : $P_{995} = (0, 30, 1, 0)$ lies on line ℓ_2
92 : $P_{1027} = (0, 31, 1, 0)$ lies on line ℓ_2

The single points on the surface are:

Points on surface but on no line

The surface has 961 points not on any line:
The points on the surface but not on lines are:

0 : $P_4 = (1, 1, 1, 1)$
1 : $P_{2163} = (18, 2, 1, 1)$
2 : $P_{2205} = (28, 3, 1, 1)$
3 : $P_{2218} = (9, 4, 1, 1)$
4 : $P_{2264} = (23, 5, 1, 1)$
5 : $P_{2287} = (14, 6, 1, 1)$
6 : $P_{2317} = (12, 7, 1, 1)$
7 : $P_{2359} = (22, 8, 1, 1)$
8 : $P_{2373} = (4, 9, 1, 1)$
9 : $P_{2426} = (25, 10, 1, 1)$
10 : $P_{2449} = (16, 11, 1, 1)$
11 : $P_{2472} = (7, 12, 1, 1)$
12 : $P_{2512} = (15, 13, 1, 1)$
13 : $P_{2535} = (6, 14, 1, 1)$
14 : $P_{2574} = (13, 15, 1, 1)$
15 : $P_{2604} = (11, 16, 1, 1)$
16 : $P_{2649} = (24, 17, 1, 1)$
17 : $P_{2659} = (2, 18, 1, 1)$
18 : $P_{2718} = (29, 19, 1, 1)$
19 : $P_{2751} = (30, 20, 1, 1)$
20 : $P_{2779} = (26, 21, 1, 1)$
21 : $P_{2793} = (8, 22, 1, 1)$
22 : $P_{2822} = (5, 23, 1, 1)$
23 : $P_{2866} = (17, 24, 1, 1)$
24 : $P_{2891} = (10, 25, 1, 1)$
25 : $P_{2934} = (21, 26, 1, 1)$
26 : $P_{2976} = (31, 27, 1, 1)$
27 : $P_{2980} = (3, 28, 1, 1)$
28 : $P_{3028} = (19, 29, 1, 1)$
29 : $P_{3061} = (20, 30, 1, 1)$
30 : $P_{3100} = (27, 31, 1, 1)$
31 : $P_{3155} = (18, 1, 2, 1)$
32 : $P_{3178} = (9, 2, 2, 1)$
33 : $P_{3215} = (14, 3, 2, 1)$
34 : $P_{3255} = (22, 4, 2, 1)$
35 : $P_{3290} = (25, 5, 2, 1)$
36 : $P_{3304} = (7, 6, 2, 1)$
37 : $P_{3335} = (6, 7, 2, 1)$
38 : $P_{3372} = (11, 8, 2, 1)$
39 : $P_{3395} = (2, 9, 2, 1)$
40 : $P_{3455} = (30, 10, 2, 1)$
41 : $P_{3465} = (8, 11, 2, 1)$
42 : $P_{3506} = (17, 12, 2, 1)$
43 : $P_{3542} = (21, 13, 2, 1)$
44 : $P_{3556} = (3, 14, 2, 1)$
45 : $P_{3605} = (20, 15, 2, 1)$

$46: P_{3640} = (23, 16, 2, 1)$
$47: P_{3661} = (12, 17, 2, 1)$
$48: P_{3682} = (1, 18, 2, 1)$
$49: P_{3741} = (28, 19, 2, 1)$
$50: P_{3760} = (15, 20, 2, 1)$
$51: P_{3790} = (13, 21, 2, 1)$
$52: P_{3813} = (4, 22, 2, 1)$
$53: P_{3857} = (16, 23, 2, 1)$
$54: P_{3899} = (26, 24, 2, 1)$
$55: P_{3910} = (5, 25, 2, 1)$
$56: P_{3961} = (24, 26, 2, 1)$
$57: P_{3998} = (29, 27, 2, 1)$
$58: P_{4020} = (19, 28, 2, 1)$
$59: P_{4060} = (27, 29, 2, 1)$
$60: P_{4075} = (10, 30, 2, 1)$
$61: P_{4128} = (31, 31, 2, 1)$
$62: P_{4189} = (28, 1, 3, 1)$
$63: P_{4207} = (14, 2, 3, 1)$
$64: P_{4248} = (23, 3, 3, 1)$
$65: P_{4264} = (7, 4, 3, 1)$
$66: P_{4302} = (13, 5, 3, 1)$
$67: P_{4346} = (25, 6, 3, 1)$
$68: P_{4357} = (4, 7, 3, 1)$
$69: P_{4402} = (17, 8, 3, 1)$
$70: P_{4448} = (31, 9, 3, 1)$
$71: P_{4469} = (20, 10, 3, 1)$
$72: P_{4500} = (19, 11, 3, 1)$
$73: P_{4543} = (30, 12, 3, 1)$
$74: P_{4550} = (5, 13, 3, 1)$
$75: P_{4579} = (2, 14, 3, 1)$
$76: P_{4633} = (24, 15, 3, 1)$
$77: P_{4667} = (26, 16, 3, 1)$
$78: P_{4681} = (8, 17, 3, 1)$
$79: P_{4734} = (29, 18, 3, 1)$
$80: P_{4748} = (11, 19, 3, 1)$
$81: P_{4779} = (10, 20, 3, 1)$
$82: P_{4822} = (21, 21, 3, 1)$
$83: P_{4860} = (27, 22, 3, 1)$
$84: P_{4868} = (3, 23, 3, 1)$
$85: P_{4912} = (15, 24, 3, 1)$
$86: P_{4935} = (6, 25, 3, 1)$
$87: P_{4977} = (16, 26, 3, 1)$
$88: P_{5015} = (22, 27, 3, 1)$
$89: P_{5026} = (1, 28, 3, 1)$
$90: P_{5075} = (18, 29, 3, 1)$
$91: P_{5101} = (12, 30, 3, 1)$
$92: P_{5130} = (9, 31, 3, 1)$
$93: P_{5194} = (9, 1, 4, 1)$
$94: P_{5239} = (22, 2, 4, 1)$
$95: P_{5256} = (7, 3, 4, 1)$
$96: P_{5292} = (11, 4, 4, 1)$
$97: P_{5343} = (30, 5, 4, 1)$
$98: P_{5362} = (17, 6, 4, 1)$
$99: P_{5380} = (3, 7, 4, 1)$
$100: P_{5432} = (23, 8, 4, 1)$
$101: P_{5442} = (1, 9, 4, 1)$
$102: P_{5488} = (15, 10, 4, 1)$
$103: P_{5509} = (4, 11, 4, 1)$
$104: P_{5563} = (26, 12, 4, 1)$
$105: P_{5593} = (24, 13, 4, 1)$
$106: P_{5620} = (19, 14, 4, 1)$
$107: P_{5643} = (10, 15, 4, 1)$
$108: P_{5690} = (25, 16, 4, 1)$
$109: P_{5703} = (6, 17, 4, 1)$
$110: P_{5747} = (18, 18, 4, 1)$
$111: P_{5775} = (14, 19, 4, 1)$
$112: P_{5814} = (21, 20, 4, 1)$
$113: P_{5845} = (20, 21, 4, 1)$
$114: P_{5859} = (2, 22, 4, 1)$
$115: P_{5897} = (8, 23, 4, 1)$
$116: P_{5934} = (13, 24, 4, 1)$
$117: P_{5969} = (16, 25, 4, 1)$
$118: P_{5997} = (12, 26, 4, 1)$
$119: P_{6045} = (28, 27, 4, 1)$
$120: P_{6076} = (27, 28, 4, 1)$
$121: P_{6112} = (31, 29, 4, 1)$
$122: P_{6118} = (5, 30, 4, 1)$
$123: P_{6174} = (29, 31, 4, 1)$
$124: P_{6232} = (23, 1, 5, 1)$
$125: P_{6266} = (25, 2, 5, 1)$
$126: P_{6286} = (13, 3, 5, 1)$
$127: P_{6335} = (30, 4, 5, 1)$
$128: P_{6361} = (24, 5, 5, 1)$
$129: P_{6389} = (20, 6, 5, 1)$
$130: P_{6432} = (31, 7, 5, 1)$
$131: P_{6448} = (15, 8, 5, 1)$
$132: P_{6487} = (22, 9, 5, 1)$
$133: P_{6509} = (12, 10, 5, 1)$
$134: P_{6547} = (18, 11, 5, 1)$
$135: P_{6571} = (10, 12, 5, 1)$
$136: P_{6596} = (3, 13, 5, 1)$
$137: P_{6654} = (29, 14, 5, 1)$
$138: P_{6665} = (8, 15, 5, 1)$
$139: P_{6710} = (21, 16, 5, 1)$
$140: P_{6748} = (27, 17, 5, 1)$
$141: P_{6764} = (11, 18, 5, 1)$
$142: P_{6811} = (26, 19, 5, 1)$
$143: P_{6823} = (6, 20, 5, 1)$
$144: P_{6865} = (16, 21, 5, 1)$
$145: P_{6890} = (9, 22, 5, 1)$
$146: P_{6914} = (1, 23, 5, 1)$
$147: P_{6950} = (5, 24, 5, 1)$
$148: P_{6979} = (2, 25, 5, 1)$
$149: P_{7028} = (19, 26, 5, 1)$
$150: P_{7058} = (17, 27, 5, 1)$
$151: P_{7101} = (28, 28, 5, 1)$
$152: P_{7119} = (14, 29, 5, 1)$
$153: P_{7141} = (4, 30, 5, 1)$

$154: P_{7176} = (7, 31, 5, 1)$
$155: P_{7247} = (14, 1, 6, 1)$
$156: P_{7272} = (7, 2, 6, 1)$
$157: P_{7322} = (25, 3, 6, 1)$
$158: P_{7346} = (17, 4, 6, 1)$
$159: P_{7381} = (20, 5, 6, 1)$
$160: P_{7423} = (30, 6, 6, 1)$
$161: P_{7427} = (2, 7, 6, 1)$
$162: P_{7483} = (26, 8, 6, 1)$
$163: P_{7518} = (29, 9, 6, 1)$
$164: P_{7531} = (10, 10, 6, 1)$
$165: P_{7580} = (27, 11, 6, 1)$
$166: P_{7600} = (15, 12, 6, 1)$
$167: P_{7633} = (16, 13, 6, 1)$
$168: P_{7650} = (1, 14, 6, 1)$
$169: P_{7693} = (12, 15, 6, 1)$
$170: P_{7726} = (13, 16, 6, 1)$
$171: P_{7749} = (4, 17, 6, 1)$
$172: P_{7805} = (28, 18, 6, 1)$
$173: P_{7832} = (23, 19, 6, 1)$
$174: P_{7846} = (5, 20, 6, 1)$
$175: P_{7897} = (24, 21, 6, 1)$
$176: P_{7936} = (31, 22, 6, 1)$
$177: P_{7956} = (19, 23, 6, 1)$
$178: P_{7990} = (21, 24, 6, 1)$
$179: P_{8004} = (3, 25, 6, 1)$
$180: P_{8041} = (8, 26, 6, 1)$
$181: P_{8076} = (11, 27, 6, 1)$
$182: P_{8115} = (18, 28, 6, 1)$
$183: P_{8138} = (9, 29, 6, 1)$
$184: P_{8167} = (6, 30, 6, 1)$
$185: P_{8215} = (22, 31, 6, 1)$
$186: P_{8269} = (12, 1, 7, 1)$
$187: P_{8295} = (6, 2, 7, 1)$
$188: P_{8325} = (4, 3, 7, 1)$
$189: P_{8356} = (3, 4, 7, 1)$
$190: P_{8416} = (31, 5, 7, 1)$
$191: P_{8419} = (2, 6, 7, 1)$
$192: P_{8475} = (26, 7, 7, 1)$
$193: P_{8500} = (19, 8, 7, 1)$
$194: P_{8534} = (21, 9, 7, 1)$
$195: P_{8574} = (29, 10, 7, 1)$
$196: P_{8607} = (30, 11, 7, 1)$
$197: P_{8610} = (1, 12, 7, 1)$
$198: P_{8655} = (14, 13, 7, 1)$
$199: P_{8686} = (13, 14, 7, 1)$
$200: P_{8727} = (22, 15, 7, 1)$
$201: P_{8764} = (27, 16, 7, 1)$
$202: P_{8786} = (17, 17, 7, 1)$
$203: P_{8825} = (24, 18, 7, 1)$
$204: P_{8841} = (8, 19, 7, 1)$
$205: P_{8893} = (28, 20, 7, 1)$
$206: P_{8906} = (9, 21, 7, 1)$
$207: P_{8944} = (15, 22, 7, 1)$
$208: P_{8986} = (25, 23, 7, 1)$
$209: P_{9011} = (18, 24, 7, 1)$
$210: P_{9048} = (23, 25, 7, 1)$
$211: P_{9064} = (7, 26, 7, 1)$
$212: P_{9105} = (16, 27, 7, 1)$
$213: P_{9141} = (20, 28, 7, 1)$
$214: P_{9163} = (10, 29, 7, 1)$
$215: P_{9196} = (11, 30, 7, 1)$
$216: P_{9222} = (5, 31, 7, 1)$
$217: P_{9303} = (22, 1, 8, 1)$
$218: P_{9324} = (11, 2, 8, 1)$
$219: P_{9362} = (17, 3, 8, 1)$
$220: P_{9400} = (23, 4, 8, 1)$
$221: P_{9424} = (15, 5, 8, 1)$
$222: P_{9467} = (26, 6, 8, 1)$
$223: P_{9492} = (19, 7, 8, 1)$
$224: P_{9530} = (25, 8, 8, 1)$
$225: P_{9555} = (18, 9, 8, 1)$
$226: P_{9590} = (21, 10, 8, 1)$
$227: P_{9603} = (2, 11, 8, 1)$
$228: P_{9646} = (13, 12, 8, 1)$
$229: P_{9677} = (12, 13, 8, 1)$
$230: P_{9724} = (27, 14, 8, 1)$
$231: P_{9734} = (5, 15, 8, 1)$
$232: P_{9791} = (30, 16, 8, 1)$
$233: P_{9796} = (3, 17, 8, 1)$
$234: P_{9834} = (9, 18, 8, 1)$
$235: P_{9864} = (7, 19, 8, 1)$
$236: P_{9913} = (24, 20, 8, 1)$
$237: P_{9931} = (10, 21, 8, 1)$
$238: P_{9954} = (1, 22, 8, 1)$
$239: P_{9989} = (4, 23, 8, 1)$
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$646: P_{23455} = (30, 27, 21, 1)$
$647: P_{23468} = (11, 28, 21, 1)$
$648: P_{23512} = (23, 29, 21, 1)$
$649: P_{23548} = (27, 30, 21, 1)$
$650: P_{23578} = (25, 31, 21, 1)$
$651: P_{23625} = (8, 1, 22, 1)$
$652: P_{23653} = (4, 2, 22, 1)$
$653: P_{23708} = (27, 3, 22, 1)$
$654: P_{23715} = (2, 4, 22, 1)$
$655: P_{23754} = (9, 5, 22, 1)$
$656: P_{23808} = (31, 6, 22, 1)$
$657: P_{23824} = (15, 7, 22, 1)$
$658: P_{23842} = (1, 8, 22, 1)$
$659: P_{23878} = (5, 9, 22, 1)$
$660: P_{23927} = (22, 10, 22, 1)$
$661: P_{23957} = (20, 11, 22, 1)$
$662: P_{23998} = (29, 12, 22, 1)$
$663: P_{24024} = (23, 13, 22, 1)$
$664: P_{24054} = (21, 14, 22, 1)$
$665: P_{24072} = (7, 15, 22, 1)$
$666: P_{24115} = (18, 16, 22, 1)$
$667: P_{24159} = (30, 17, 22, 1)$
$668: P_{24177} = (16, 18, 22, 1)$
$669: P_{24212} = (19, 19, 22, 1)$
$670: P_{24236} = (11, 20, 22, 1)$
$671: P_{24271} = (14, 21, 22, 1)$
$672: P_{24299} = (10, 22, 22, 1)$
$673: P_{24334} = (13, 23, 22, 1)$
$674: P_{24381} = (28, 24, 22, 1)$
$675: P_{24411} = (26, 25, 22, 1)$
$676: P_{24442} = (25, 26, 22, 1)$
$677: P_{24452} = (3, 27, 22, 1)$
$678: P_{24505} = (24, 28, 22, 1)$
$679: P_{24525} = (12, 29, 22, 1)$
$680: P_{24562} = (17, 30, 22, 1)$
$681: P_{24583} = (6, 31, 22, 1)$
$682: P_{24646} = (5, 1, 23, 1)$
$683: P_{24689} = (16, 2, 23, 1)$
$684: P_{24708} = (3, 3, 23, 1)$
$685: P_{24745} = (8, 4, 23, 1)$
$686: P_{24770} = (1, 5, 23, 1)$
$687: P_{24820} = (19, 6, 23, 1)$
$688: P_{24858} = (25, 7, 23, 1)$
$689: P_{24869} = (4, 8, 23, 1)$
$690: P_{24917} = (20, 9, 23, 1)$
$691: P_{24947} = (18, 10, 23, 1)$
$692: P_{24987} = (26, 11, 23, 1)$
$693: P_{25020} = (27, 12, 23, 1)$

694 : $P_{25047} = (22, 13, 23, 1)$
695 : $P_{25087} = (30, 14, 23, 1)$
696 : $P_{25117} = (28, 15, 23, 1)$
697 : $P_{25123} = (2, 16, 23, 1)$
698 : $P_{25176} = (23, 17, 23, 1)$
699 : $P_{25195} = (10, 18, 23, 1)$
700 : $P_{25223} = (6, 19, 23, 1)$
701 : $P_{25258} = (9, 20, 23, 1)$
702 : $P_{25310} = (29, 21, 23, 1)$
703 : $P_{25326} = (13, 22, 23, 1)$
704 : $P_{25362} = (17, 23, 23, 1)$
705 : $P_{25408} = (31, 24, 23, 1)$
706 : $P_{25416} = (7, 25, 23, 1)$
707 : $P_{25452} = (11, 26, 23, 1)$
708 : $P_{25485} = (12, 27, 23, 1)$
709 : $P_{25520} = (15, 28, 23, 1)$
710 : $P_{25558} = (21, 29, 23, 1)$
711 : $P_{25583} = (14, 30, 23, 1)$
712 : $P_{25625} = (24, 31, 23, 1)$
713 : $P_{25682} = (17, 1, 24, 1)$
714 : $P_{25723} = (26, 2, 24, 1)$
715 : $P_{25744} = (15, 3, 24, 1)$
716 : $P_{25774} = (13, 4, 24, 1)$
717 : $P_{25798} = (5, 5, 24, 1)$
718 : $P_{25846} = (21, 6, 24, 1)$
719 : $P_{25875} = (18, 7, 24, 1)$
720 : $P_{25909} = (20, 8, 24, 1)$
721 : $P_{25935} = (14, 9, 24, 1)$
722 : $P_{25969} = (16, 10, 24, 1)$
723 : $P_{26014} = (29, 11, 24, 1)$
724 : $P_{26041} = (24, 12, 24, 1)$
725 : $P_{26053} = (4, 13, 24, 1)$
726 : $P_{26090} = (9, 14, 24, 1)$
727 : $P_{26116} = (3, 15, 24, 1)$
728 : $P_{26155} = (10, 16, 24, 1)$
729 : $P_{26178} = (1, 17, 24, 1)$
730 : $P_{26216} = (7, 18, 24, 1)$
731 : $P_{26271} = (30, 19, 24, 1)$
732 : $P_{26281} = (8, 20, 24, 1)$
733 : $P_{26311} = (6, 21, 24, 1)$
734 : $P_{26365} = (28, 22, 24, 1)$
735 : $P_{26400} = (31, 23, 24, 1)$
736 : $P_{26413} = (12, 24, 24, 1)$
737 : $P_{26460} = (27, 25, 24, 1)$
738 : $P_{26467} = (2, 26, 24, 1)$
739 : $P_{26522} = (25, 27, 24, 1)$
740 : $P_{26551} = (22, 28, 24, 1)$
741 : $P_{26572} = (11, 29, 24, 1)$
742 : $P_{26612} = (19, 30, 24, 1)$
743 : $P_{26648} = (23, 31, 24, 1)$
744 : $P_{26699} = (10, 1, 25, 1)$
745 : $P_{26726} = (5, 2, 25, 1)$
746 : $P_{26759} = (6, 3, 25, 1)$
747 : $P_{26801} = (16, 4, 25, 1)$
748 : $P_{26819} = (2, 5, 25, 1)$
749 : $P_{26852} = (3, 6, 25, 1)$
750 : $P_{26904} = (23, 7, 25, 1)$
751 : $P_{26921} = (8, 8, 25, 1)$
752 : $P_{26958} = (13, 9, 25, 1)$
753 : $P_{26978} = (1, 10, 25, 1)$
754 : $P_{27026} = (17, 11, 25, 1)$
755 : $P_{27060} = (19, 12, 25, 1)$
756 : $P_{27082} = (9, 13, 25, 1)$
757 : $P_{27130} = (25, 14, 25, 1)$
758 : $P_{27166} = (29, 15, 25, 1)$
759 : $P_{27173} = (4, 16, 25, 1)$
760 : $P_{27212} = (11, 17, 25, 1)$
761 : $P_{27253} = (20, 18, 25, 1)$
762 : $P_{27277} = (12, 19, 25, 1)$
763 : $P_{27315} = (18, 20, 25, 1)$
764 : $P_{27360} = (31, 21, 25, 1)$
765 : $P_{27387} = (26, 22, 25, 1)$
766 : $P_{27400} = (7, 23, 25, 1)$
767 : $P_{27452} = (27, 24, 25, 1)$
768 : $P_{27471} = (14, 25, 25, 1)$
769 : $P_{27511} = (22, 26, 25, 1)$
770 : $P_{27545} = (24, 27, 25, 1)$
771 : $P_{27583} = (30, 28, 25, 1)$
772 : $P_{27600} = (15, 29, 25, 1)$
773 : $P_{27645} = (28, 30, 25, 1)$
774 : $P_{27670} = (21, 31, 25, 1)$
775 : $P_{27734} = (21, 1, 26, 1)$
776 : $P_{27769} = (24, 2, 26, 1)$
777 : $P_{27793} = (16, 3, 26, 1)$
778 : $P_{27821} = (12, 4, 26, 1)$
779 : $P_{27860} = (19, 5, 26, 1)$
780 : $P_{27881} = (8, 6, 26, 1)$
781 : $P_{27912} = (7, 7, 26, 1)$
782 : $P_{27943} = (6, 8, 26, 1)$
783 : $P_{27999} = (30, 9, 26, 1)$
784 : $P_{28028} = (27, 10, 26, 1)$
785 : $P_{28056} = (23, 11, 26, 1)$
786 : $P_{28069} = (4, 12, 26, 1)$
787 : $P_{28126} = (29, 13, 26, 1)$
788 : $P_{28146} = (17, 14, 26, 1)$
789 : $P_{28179} = (18, 15, 26, 1)$
790 : $P_{28196} = (3, 16, 26, 1)$
791 : $P_{28239} = (14, 17, 26, 1)$
792 : $P_{28272} = (15, 18, 26, 1)$
793 : $P_{28294} = (5, 19, 26, 1)$
794 : $P_{28352} = (31, 20, 26, 1)$
795 : $P_{28354} = (1, 21, 26, 1)$
796 : $P_{28410} = (25, 22, 26, 1)$
797 : $P_{28428} = (11, 23, 26, 1)$
798 : $P_{28451} = (2, 24, 26, 1)$
799 : $P_{28503} = (22, 25, 26, 1)$
800 : $P_{28541} = (28, 26, 26, 1)$
801 : $P_{28555} = (10, 27, 26, 1)$

802 : $P_{28603} = (26, 28, 26, 1)$
803 : $P_{28622} = (13, 29, 26, 1)$
804 : $P_{28650} = (9, 30, 26, 1)$
805 : $P_{28693} = (20, 31, 26, 1)$
806 : $P_{28768} = (31, 1, 27, 1)$
807 : $P_{28798} = (29, 2, 27, 1)$
808 : $P_{28823} = (22, 3, 27, 1)$
809 : $P_{28861} = (28, 4, 27, 1)$
810 : $P_{28882} = (17, 5, 27, 1)$
811 : $P_{28908} = (11, 6, 27, 1)$
812 : $P_{28945} = (16, 7, 27, 1)$
813 : $P_{28975} = (14, 8, 27, 1)$
814 : $P_{29012} = (19, 9, 27, 1)$
815 : $P_{29051} = (26, 10, 27, 1)$
816 : $P_{29063} = (6, 11, 27, 1)$
817 : $P_{29112} = (23, 12, 27, 1)$
818 : $P_{29141} = (20, 13, 27, 1)$
819 : $P_{29161} = (8, 14, 27, 1)$
820 : $P_{29200} = (15, 15, 27, 1)$
821 : $P_{29224} = (7, 16, 27, 1)$
822 : $P_{29254} = (5, 17, 27, 1)$
823 : $P_{29308} = (27, 18, 27, 1)$
824 : $P_{29322} = (9, 19, 27, 1)$
825 : $P_{29358} = (13, 20, 27, 1)$
826 : $P_{29407} = (30, 21, 27, 1)$
827 : $P_{29412} = (3, 22, 27, 1)$
828 : $P_{29453} = (12, 23, 27, 1)$
829 : $P_{29498} = (25, 24, 27, 1)$
830 : $P_{29529} = (24, 25, 27, 1)$
831 : $P_{29547} = (10, 26, 27, 1)$
832 : $P_{29587} = (18, 27, 27, 1)$
833 : $P_{29605} = (4, 28, 27, 1)$
834 : $P_{29635} = (2, 29, 27, 1)$
835 : $P_{29686} = (21, 30, 27, 1)$
836 : $P_{29698} = (1, 31, 27, 1)$
837 : $P_{29764} = (3, 1, 28, 1)$
838 : $P_{29812} = (19, 2, 28, 1)$
839 : $P_{29826} = (1, 3, 28, 1)$
840 : $P_{29884} = (27, 4, 28, 1)$
841 : $P_{29917} = (28, 5, 28, 1)$
842 : $P_{29939} = (18, 6, 28, 1)$
843 : $P_{29973} = (20, 7, 28, 1)$
844 : $P_{30016} = (31, 8, 28, 1)$
845 : $P_{30029} = (12, 9, 28, 1)$
846 : $P_{30063} = (14, 10, 28, 1)$
847 : $P_{30102} = (21, 11, 28, 1)$
848 : $P_{30122} = (9, 12, 28, 1)$
849 : $P_{30162} = (17, 13, 28, 1)$
850 : $P_{30187} = (10, 14, 28, 1)$
851 : $P_{30232} = (23, 15, 28, 1)$
852 : $P_{30270} = (29, 16, 28, 1)$
853 : $P_{30286} = (13, 17, 28, 1)$
854 : $P_{30311} = (6, 18, 28, 1)$
855 : $P_{30339} = (2, 19, 28, 1)$
856 : $P_{30376} = (7, 20, 28, 1)$
857 : $P_{30412} = (11, 21, 28, 1)$
858 : $P_{30457} = (24, 22, 28, 1)$
859 : $P_{30480} = (15, 23, 28, 1)$
860 : $P_{30519} = (22, 24, 28, 1)$
861 : $P_{30559} = (30, 25, 28, 1)$
862 : $P_{30587} = (26, 26, 28, 1)$
863 : $P_{30597} = (4, 27, 28, 1)$
864 : $P_{30630} = (5, 28, 28, 1)$
865 : $P_{30673} = (16, 29, 28, 1)$
866 : $P_{30714} = (25, 30, 28, 1)$
867 : $P_{30729} = (8, 31, 28, 1)$
868 : $P_{30804} = (19, 1, 29, 1)$
869 : $P_{30844} = (27, 2, 29, 1)$
870 : $P_{30867} = (18, 3, 29, 1)$
871 : $P_{30912} = (31, 4, 29, 1)$
872 : $P_{30927} = (14, 5, 29, 1)$
873 : $P_{30954} = (9, 6, 29, 1)$
874 : $P_{30987} = (10, 7, 29, 1)$
875 : $P_{31038} = (29, 8, 29, 1)$
876 : $P_{31047} = (6, 9, 29, 1)$
877 : $P_{31080} = (7, 10, 29, 1)$
878 : $P_{31129} = (24, 11, 29, 1)$
879 : $P_{31159} = (22, 12, 29, 1)$
880 : $P_{31195} = (26, 13, 29, 1)$
881 : $P_{31206} = (5, 14, 29, 1)$
882 : $P_{31258} = (25, 15, 29, 1)$
883 : $P_{31293} = (28, 16, 29, 1)$
884 : $P_{31317} = (20, 17, 29, 1)$
885 : $P_{31332} = (3, 18, 29, 1)$
886 : $P_{31362} = (1, 19, 29, 1)$
887 : $P_{31410} = (17, 20, 29, 1)$
888 : $P_{31448} = (23, 21, 29, 1)$
889 : $P_{31469} = (12, 22, 29, 1)$
890 : $P_{31510} = (21, 23, 29, 1)$
891 : $P_{31532} = (11, 24, 29, 1)$
892 : $P_{31568} = (15, 25, 29, 1)$
893 : $P_{31598} = (13, 26, 29, 1)$
894 : $P_{31619} = (2, 27, 29, 1)$
895 : $P_{31665} = (16, 28, 29, 1)$
896 : $P_{31689} = (8, 29, 29, 1)$
897 : $P_{31743} = (30, 30, 29, 1)$
898 : $P_{31749} = (4, 31, 29, 1)$
899 : $P_{31829} = (20, 1, 30, 1)$
900 : $P_{31851} = (10, 2, 30, 1)$
901 : $P_{31885} = (12, 3, 30, 1)$
902 : $P_{31910} = (5, 4, 30, 1)$
903 : $P_{31941} = (4, 5, 30, 1)$
904 : $P_{31975} = (6, 6, 30, 1)$
905 : $P_{32012} = (11, 7, 30, 1)$
906 : $P_{32049} = (16, 8, 30, 1)$
907 : $P_{32091} = (26, 9, 30, 1)$
908 : $P_{32099} = (2, 10, 30, 1)$
909 : $P_{32136} = (7, 11, 30, 1)$

910 : $P_{32164} = (3, 12, 30, 1)$
911 : $P_{32211} = (18, 13, 30, 1)$
912 : $P_{32248} = (23, 14, 30, 1)$
913 : $P_{32288} = (31, 15, 30, 1)$
914 : $P_{32297} = (8, 16, 30, 1)$
915 : $P_{32343} = (22, 17, 30, 1)$
916 : $P_{32366} = (13, 18, 30, 1)$
917 : $P_{32409} = (24, 19, 30, 1)$
918 : $P_{32418} = (1, 20, 30, 1)$
919 : $P_{32476} = (27, 21, 30, 1)$
920 : $P_{32498} = (17, 22, 30, 1)$
921 : $P_{32527} = (14, 23, 30, 1)$
922 : $P_{32564} = (19, 24, 30, 1)$
923 : $P_{32605} = (28, 25, 30, 1)$
924 : $P_{32618} = (9, 26, 30, 1)$
925 : $P_{32662} = (21, 27, 30, 1)$
926 : $P_{32698} = (25, 28, 30, 1)$
927 : $P_{32735} = (30, 29, 30, 1)$
928 : $P_{32766} = (29, 30, 30, 1)$
929 : $P_{32784} = (15, 31, 30, 1)$
930 : $P_{32860} = (27, 1, 31, 1)$
931 : $P_{32896} = (31, 2, 31, 1)$
932 : $P_{32906} = (9, 3, 31, 1)$
933 : $P_{32958} = (29, 4, 31, 1)$
934 : $P_{32968} = (7, 5, 31, 1)$
935 : $P_{33015} = (22, 6, 31, 1)$
936 : $P_{33030} = (5, 7, 31, 1)$
937 : $P_{33085} = (28, 8, 31, 1)$
938 : $P_{33092} = (3, 9, 31, 1)$
939 : $P_{33138} = (17, 10, 31, 1)$
940 : $P_{33165} = (12, 11, 31, 1)$
941 : $P_{33196} = (11, 12, 31, 1)$
942 : $P_{33230} = (13, 13, 31, 1)$
943 : $P_{33265} = (16, 14, 31, 1)$
944 : $P_{33311} = (30, 15, 31, 1)$
945 : $P_{33327} = (14, 16, 31, 1)$
946 : $P_{33355} = (10, 17, 31, 1)$
947 : $P_{33396} = (19, 18, 31, 1)$
948 : $P_{33427} = (18, 19, 31, 1)$
949 : $P_{33467} = (26, 20, 31, 1)$
950 : $P_{33498} = (25, 21, 31, 1)$
951 : $P_{33511} = (6, 22, 31, 1)$
952 : $P_{33561} = (24, 23, 31, 1)$
953 : $P_{33592} = (23, 24, 31, 1)$
954 : $P_{33622} = (21, 25, 31, 1)$
955 : $P_{33653} = (20, 26, 31, 1)$
956 : $P_{33666} = (1, 27, 31, 1)$
957 : $P_{33705} = (8, 28, 31, 1)$
958 : $P_{33733} = (4, 29, 31, 1)$
959 : $P_{33776} = (15, 30, 31, 1)$
960 : $P_{33795} = (2, 31, 31, 1)$

Line Intersection Graph

	0	1	2
0	0	1	1
1	1	0	1
2	1	1	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2
in point	P_0	P_1

Line 1 intersects

Line	ℓ_0	ℓ_2
in point	P_0	P_2

Line 2 intersects

Line	ℓ_0	ℓ_1
in point	P_1	P_2

The surface has 1057 points:
Too many to print.