Rank-73737 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

$$X_1^3 + X_2^3 + X_0X_3^2 + X_0X_1X_2 = 0$$

(0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is 1108379717

General information

Number of lines	3
Number of points	1057
Number of singular points	2
Number of Eckardt points	0
Number of double points	2
Number of single points	95
Number of points off lines	960
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33^3
Type of lines on points	2^2, 1^{95}, 0^{960}

Singular Points

The surface has 2 singular points:

0 : $P_0 = \mathbf{P}(1,0,0,0) = \mathbf{P}(1,0,0,0)$
1 : $P_4 = \mathbf{P}(1,1,1,1) = \mathbf{P}(1,1,1,1)$

The 3 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{33} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{33} = \mathbf{Pl}(1,0,1,0,1,0)_{1153}$$

$$\ell_1 = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082433} = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082433} = \mathbf{Pl}(0,1,0,1,0,0)_{97}$$

$$\ell_2 = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{34882} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{34882} = \mathbf{Pl}(1,1,1,1,0,1)_{38818}$$

Rank of lines: (33, 1082433, 34882)
Rank of points on Klein quadric: (1153, 97, 38818)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 2 Double points:
The double points on the surface are:

$P_{2114} = (0,1,1,1) = \ell_0 \cap \ell_1$
$P_{67} = (0,1,1,0) = \ell_1 \cap \ell_2$

Single Points

The surface has 95 single points:
The single points on the surface are:

0 : $P_0 = (1,0,0,0)$ lies on line ℓ_0
1 : $P_3 = (0,0,0,1)$ lies on line ℓ_1
2 : $P_4 = (1,1,1,1)$ lies on line ℓ_0
3 : $P_{1091} = (1,1,0,1)$ lies on line ℓ_2
4 : $P_{2083} = (1,0,1,1)$ lies on line ℓ_2
5 : $P_{2115} = (2,1,1,1)$ lies on line ℓ_0
6 : $P_{2116} = (3,1,1,1)$ lies on line ℓ_0
7 : $P_{2117} = (4,1,1,1)$ lies on line ℓ_0
8 : $P_{2118} = (5,1,1,1)$ lies on line ℓ_0
9 : $P_{2119} = (6,1,1,1)$ lies on line ℓ_0
10 : $P_{2120} = (7,1,1,1)$ lies on line ℓ_0
11 : $P_{2121} = (8,1,1,1)$ lies on line ℓ_0
12 : $P_{2122} = (9,1,1,1)$ lies on line ℓ_0
13 : $P_{2123} = (10,1,1,1)$ lies on line ℓ_0
14 : $P_{2124} = (11,1,1,1)$ lies on line ℓ_0
15 : $P_{2125} = (12,1,1,1)$ lies on line ℓ_0
16 : $P_{2126} = (13,1,1,1)$ lies on line ℓ_0
17 : $P_{2127} = (14,1,1,1)$ lies on line ℓ_0
18 : $P_{2128} = (15,1,1,1)$ lies on line ℓ_0
19 : $P_{2129} = (16,1,1,1)$ lies on line ℓ_0
20 : $P_{2130} = (17,1,1,1)$ lies on line ℓ_0
21 : $P_{2131} = (18,1,1,1)$ lies on line ℓ_0
22 : $P_{2132} = (19,1,1,1)$ lies on line ℓ_0
23 : $P_{2133} = (20,1,1,1)$ lies on line ℓ_0
24 : $P_{2134} = (21,1,1,1)$ lies on line ℓ_0
25 : $P_{2135} = (22,1,1,1)$ lies on line ℓ_0
26 : $P_{2136} = (23,1,1,1)$ lies on line ℓ_0
27 : $P_{2137} = (24,1,1,1)$ lies on line ℓ_0
28 : $P_{2138} = (25,1,1,1)$ lies on line ℓ_0
29 : $P_{2139} = (26,1,1,1)$ lies on line ℓ_0
30 : $P_{2140} = (27,1,1,1)$ lies on line ℓ_0
31 : $P_{2141} = (28,1,1,1)$ lies on line ℓ_0
32 : $P_{2142} = (29,1,1,1)$ lies on line ℓ_0
33 : $P_{2143} = (30,1,1,1)$ lies on line ℓ_0
34 : $P_{2144} = (31,1,1,1)$ lies on line ℓ_0
35 : $P_{3169} = (0,2,2,1)$ lies on line ℓ_1
36 : $P_{3202} = (1,3,2,1)$ lies on line ℓ_2
37 : $P_{4194} = (1,2,3,1)$ lies on line ℓ_2
38 : $P_{4225} = (0,3,3,1)$ lies on line ℓ_1
39 : $P_{5281} = (0,4,4,1)$ lies on line ℓ_1
40 : $P_{5314} = (1,5,4,1)$ lies on line ℓ_2
41 : $P_{6306} = (1,4,5,1)$ lies on line ℓ_2
42 : $P_{6337} = (0,5,5,1)$ lies on line ℓ_1
43 : $P_{7393} = (0,6,6,1)$ lies on line ℓ_1
44 : $P_{7426} = (1,7,6,1)$ lies on line ℓ_2
45 : $P_{8418} = (1,6,7,1)$ lies on line ℓ_2
46 : $P_{8449} = (0,7,7,1)$ lies on line ℓ_1
47 : $P_{9505} = (0,8,8,1)$ lies on line ℓ_1
48 : $P_{9538} = (1,9,8,1)$ lies on line ℓ_2
49 : $P_{10530} = (1,8,9,1)$ lies on line ℓ_2
50 : $P_{10561} = (0,9,9,1)$ lies on line ℓ_1
51 : $P_{11617} = (0,10,10,1)$ lies on line ℓ_1

52 : $P_{11650} = (1, 11, 10, 1)$ lies on line ℓ_2
53 : $P_{12642} = (1, 10, 11, 1)$ lies on line ℓ_2
54 : $P_{12673} = (0, 11, 11, 1)$ lies on line ℓ_1
55 : $P_{13729} = (0, 12, 12, 1)$ lies on line ℓ_1
56 : $P_{13762} = (1, 13, 12, 1)$ lies on line ℓ_2
57 : $P_{14754} = (1, 12, 13, 1)$ lies on line ℓ_2
58 : $P_{14785} = (0, 13, 13, 1)$ lies on line ℓ_1
59 : $P_{15841} = (0, 14, 14, 1)$ lies on line ℓ_1
60 : $P_{15874} = (1, 15, 14, 1)$ lies on line ℓ_2
61 : $P_{16866} = (1, 14, 15, 1)$ lies on line ℓ_2
62 : $P_{16897} = (0, 15, 15, 1)$ lies on line ℓ_1
63 : $P_{17953} = (0, 16, 16, 1)$ lies on line ℓ_1
64 : $P_{17986} = (1, 17, 16, 1)$ lies on line ℓ_2
65 : $P_{18978} = (1, 16, 17, 1)$ lies on line ℓ_2
66 : $P_{19009} = (0, 17, 17, 1)$ lies on line ℓ_1
67 : $P_{20065} = (0, 18, 18, 1)$ lies on line ℓ_1
68 : $P_{20098} = (1, 19, 18, 1)$ lies on line ℓ_2
69 : $P_{21090} = (1, 18, 19, 1)$ lies on line ℓ_2
70 : $P_{21121} = (0, 19, 19, 1)$ lies on line ℓ_1
71 : $P_{22177} = (0, 20, 20, 1)$ lies on line ℓ_1
72 : $P_{22210} = (1, 21, 20, 1)$ lies on line ℓ_2
73 : $P_{23202} = (1, 20, 21, 1)$ lies on line ℓ_2
74 : $P_{23233} = (0, 21, 21, 1)$ lies on line ℓ_1
75 : $P_{24289} = (0, 22, 22, 1)$ lies on line ℓ_1
76 : $P_{24322} = (1, 23, 22, 1)$ lies on line ℓ_2
77 : $P_{25314} = (1, 22, 23, 1)$ lies on line ℓ_2
78 : $P_{25345} = (0, 23, 23, 1)$ lies on line ℓ_1
79 : $P_{26401} = (0, 24, 24, 1)$ lies on line ℓ_1
80 : $P_{26434} = (1, 25, 24, 1)$ lies on line ℓ_2
81 : $P_{27426} = (1, 24, 25, 1)$ lies on line ℓ_2
82 : $P_{27457} = (0, 25, 25, 1)$ lies on line ℓ_1
83 : $P_{28513} = (0, 26, 26, 1)$ lies on line ℓ_1
84 : $P_{28546} = (1, 27, 26, 1)$ lies on line ℓ_2
85 : $P_{29538} = (1, 26, 27, 1)$ lies on line ℓ_2
86 : $P_{29569} = (0, 27, 27, 1)$ lies on line ℓ_1
87 : $P_{30625} = (0, 28, 28, 1)$ lies on line ℓ_1
88 : $P_{30658} = (1, 29, 28, 1)$ lies on line ℓ_2
89 : $P_{31650} = (1, 28, 29, 1)$ lies on line ℓ_2
90 : $P_{31681} = (0, 29, 29, 1)$ lies on line ℓ_1
91 : $P_{32737} = (0, 30, 30, 1)$ lies on line ℓ_1
92 : $P_{32770} = (1, 31, 30, 1)$ lies on line ℓ_2
93 : $P_{33762} = (1, 30, 31, 1)$ lies on line ℓ_2
94 : $P_{33793} = (0, 31, 31, 1)$ lies on line ℓ_1

The single points on the surface are:

Points on surface but on no line

The surface has 960 points not on any line:
The points on the surface but not on lines are:

0 : $P_{121} = (22, 2, 1, 0)$
1 : $P_{156} = (25, 3, 1, 0)$
2 : $P_{188} = (25, 4, 1, 0)$
3 : $P_{201} = (6, 5, 1, 0)$
4 : $P_{253} = (26, 6, 1, 0)$
5 : $P_{284} = (25, 7, 1, 0)$
6 : $P_{319} = (28, 8, 1, 0)$
7 : $P_{338} = (15, 9, 1, 0)$
8 : $P_{378} = (23, 10, 1, 0)$
9 : $P_{418} = (31, 11, 1, 0)$
10 : $P_{448} = (29, 12, 1, 0)$
11 : $P_{471} = (20, 13, 1, 0)$
12 : $P_{507} = (24, 14, 1, 0)$
13 : $P_{533} = (18, 15, 1, 0)$
14 : $P_{553} = (6, 16, 1, 0)$
15 : $P_{599} = (20, 17, 1, 0)$
16 : $P_{622} = (11, 18, 1, 0)$
17 : $P_{664} = (21, 19, 1, 0)$
18 : $P_{678} = (3, 20, 1, 0)$
19 : $P_{713} = (6, 21, 1, 0)$
20 : $P_{756} = (17, 22, 1, 0)$
21 : $P_{800} = (29, 23, 1, 0)$
22 : $P_{825} = (22, 24, 1, 0)$
23 : $P_{847} = (12, 25, 1, 0)$
24 : $P_{889} = (22, 26, 1, 0)$
25 : $P_{928} = (29, 27, 1, 0)$
26 : $P_{951} = (20, 28, 1, 0)$
27 : $P_{968} = (5, 29, 1, 0)$
28 : $P_{1002} = (7, 30, 1, 0)$
29 : $P_{1036} = (9, 31, 1, 0)$
30 : $P_{1130} = (8, 2, 0, 1)$
31 : $P_{1169} = (15, 3, 0, 1)$
32 : $P_{1196} = (10, 4, 0, 1)$
33 : $P_{1249} = (31, 5, 0, 1)$
34 : $P_{1273} = (23, 6, 0, 1)$
35 : $P_{1286} = (4, 7, 0, 1)$
36 : $P_{1340} = (26, 8, 0, 1)$
37 : $P_{1371} = (25, 9, 0, 1)$
38 : $P_{1381} = (3, 10, 0, 1)$
39 : $P_{1416} = (6, 11, 0, 1)$
40 : $P_{1451} = (9, 12, 0, 1)$
41 : $P_{1504} = (30, 13, 0, 1)$
42 : $P_{1511} = (5, 14, 0, 1)$
43 : $P_{1558} = (20, 15, 0, 1)$

$44: P_{1584} = (14, 16, 0, 1)$
$45: P_{1620} = (18, 17, 0, 1)$
$46: P_{1656} = (22, 18, 0, 1)$
$47: P_{1678} = (12, 19, 0, 1)$
$48: P_{1722} = (24, 20, 0, 1)$
$49: P_{1746} = (16, 21, 0, 1)$
$50: P_{1783} = (21, 22, 0, 1)$
$51: P_{1821} = (27, 23, 0, 1)$
$52: P_{1828} = (2, 24, 0, 1)$
$53: P_{1886} = (28, 25, 0, 1)$
$54: P_{1901} = (11, 26, 0, 1)$
$55: P_{1941} = (19, 27, 0, 1)$
$56: P_{1967} = (13, 28, 0, 1)$
$57: P_{1993} = (7, 29, 0, 1)$
$58: P_{2035} = (17, 30, 0, 1)$
$59: P_{2079} = (29, 31, 0, 1)$
$60: P_{2152} = (7, 2, 1, 1)$
$61: P_{2184} = (7, 3, 1, 1)$
$62: P_{2230} = (21, 4, 1, 1)$
$63: P_{2262} = (21, 5, 1, 1)$
$64: P_{2292} = (19, 6, 1, 1)$
$65: P_{2324} = (19, 7, 1, 1)$
$66: P_{2340} = (3, 8, 1, 1)$
$67: P_{2372} = (3, 9, 1, 1)$
$68: P_{2406} = (5, 10, 1, 1)$
$69: P_{2438} = (5, 11, 1, 1)$
$70: P_{2488} = (23, 12, 1, 1)$
$71: P_{2520} = (23, 13, 1, 1)$
$72: P_{2546} = (17, 14, 1, 1)$
$73: P_{2578} = (17, 15, 1, 1)$
$74: P_{2621} = (28, 16, 1, 1)$
$75: P_{2653} = (28, 17, 1, 1)$
$76: P_{2683} = (26, 18, 1, 1)$
$77: P_{2715} = (26, 19, 1, 1)$
$78: P_{2729} = (8, 20, 1, 1)$
$79: P_{2761} = (8, 21, 1, 1)$
$80: P_{2799} = (14, 22, 1, 1)$
$81: P_{2831} = (14, 23, 1, 1)$
$82: P_{2879} = (30, 24, 1, 1)$
$83: P_{2911} = (30, 25, 1, 1)$
$84: P_{2937} = (24, 26, 1, 1)$
$85: P_{2969} = (24, 27, 1, 1)$
$86: P_{2987} = (10, 28, 1, 1)$
$87: P_{3019} = (10, 29, 1, 1)$
$88: P_{3053} = (12, 30, 1, 1)$
$89: P_{3085} = (12, 31, 1, 1)$
$90: P_{3113} = (8, 0, 2, 1)$
$91: P_{3144} = (7, 1, 2, 1)$
$92: P_{3241} = (8, 4, 2, 1)$
$93: P_{3283} = (18, 5, 2, 1)$
$94: P_{3317} = (20, 6, 2, 1)$
$95: P_{3351} = (22, 7, 2, 1)$
$96: P_{3373} = (12, 8, 2, 1)$
$97: P_{3423} = (30, 9, 2, 1)$
$98: P_{3430} = (5, 10, 2, 1)$
$99: P_{3476} = (19, 11, 2, 1)$
$100: P_{3499} = (10, 12, 2, 1)$
$101: P_{3535} = (14, 13, 2, 1)$
$102: P_{3578} = (25, 14, 2, 1)$
$103: P_{3594} = (9, 15, 2, 1)$
$104: P_{3636} = (19, 16, 2, 1)$
$105: P_{3673} = (24, 17, 2, 1)$
$106: P_{3715} = (2, 19, 2, 1)$
$107: P_{3776} = (31, 20, 2, 1)$
$108: P_{3803} = (26, 21, 2, 1)$
$109: P_{3816} = (7, 22, 2, 1)$
$110: P_{3848} = (7, 23, 2, 1)$
$111: P_{3891} = (18, 24, 2, 1)$
$112: P_{3922} = (17, 25, 2, 1)$
$113: P_{3966} = (29, 26, 2, 1)$
$114: P_{3988} = (19, 27, 2, 1)$
$115: P_{4016} = (15, 28, 2, 1)$
$116: P_{4051} = (18, 29, 2, 1)$
$117: P_{4081} = (16, 30, 2, 1)$
$118: P_{4125} = (28, 31, 2, 1)$
$119: P_{4144} = (15, 0, 3, 1)$
$120: P_{4168} = (7, 1, 3, 1)$
$121: P_{4279} = (22, 4, 3, 1)$
$122: P_{4304} = (15, 5, 3, 1)$
$123: P_{4346} = (25, 6, 3, 1)$
$124: P_{4383} = (30, 7, 3, 1)$
$125: P_{4407} = (22, 8, 3, 1)$
$126: P_{4423} = (6, 9, 3, 1)$
$127: P_{4454} = (5, 10, 3, 1)$
$128: P_{4508} = (27, 11, 3, 1)$
$129: P_{4535} = (22, 12, 3, 1)$
$130: P_{4573} = (28, 13, 3, 1)$
$131: P_{4589} = (12, 14, 3, 1)$
$132: P_{4623} = (14, 15, 3, 1)$
$133: P_{4671} = (30, 16, 3, 1)$
$134: P_{4679} = (6, 17, 3, 1)$
$135: P_{4728} = (23, 18, 3, 1)$
$136: P_{4750} = (13, 19, 3, 1)$
$137: P_{4774} = (5, 20, 3, 1)$
$138: P_{4819} = (18, 21, 3, 1)$
$139: P_{4860} = (27, 22, 3, 1)$
$140: P_{4895} = (30, 23, 3, 1)$
$141: P_{4903} = (6, 24, 3, 1)$
$142: P_{4954} = (25, 25, 3, 1)$
$143: P_{4972} = (11, 26, 3, 1)$
$144: P_{5024} = (31, 27, 3, 1)$
$145: P_{5084} = (27, 29, 3, 1)$
$146: P_{5094} = (5, 30, 3, 1)$
$147: P_{5146} = (25, 31, 3, 1)$
$148: P_{5163} = (10, 0, 4, 1)$
$149: P_{5206} = (21, 1, 4, 1)$
$150: P_{5225} = (8, 2, 4, 1)$
$151: P_{5271} = (22, 3, 4, 1)$

$152: P_{5357} = (12, 6, 4, 1)$
$153: P_{5386} = (9, 7, 4, 1)$
$154: P_{5413} = (4, 8, 4, 1)$
$155: P_{5499} = (26, 10, 4, 1)$
$156: P_{5524} = (19, 11, 4, 1)$
$157: P_{5544} = (7, 12, 4, 1)$
$158: P_{5577} = (8, 13, 4, 1)$
$159: P_{5618} = (17, 14, 4, 1)$
$160: P_{5641} = (8, 15, 4, 1)$
$161: P_{5675} = (10, 16, 4, 1)$
$162: P_{5706} = (9, 17, 4, 1)$
$163: P_{5752} = (23, 18, 4, 1)$
$164: P_{5774} = (13, 19, 4, 1)$
$165: P_{5822} = (29, 20, 4, 1)$
$166: P_{5850} = (25, 21, 4, 1)$
$167: P_{5866} = (9, 22, 4, 1)$
$168: P_{5920} = (31, 23, 4, 1)$
$169: P_{5942} = (21, 24, 4, 1)$
$170: P_{5974} = (21, 25, 4, 1)$
$171: P_{5999} = (14, 26, 4, 1)$
$172: P_{6047} = (30, 27, 4, 1)$
$173: P_{6052} = (3, 28, 4, 1)$
$174: P_{6099} = (18, 29, 4, 1)$
$175: P_{6119} = (6, 30, 4, 1)$
$176: P_{6156} = (11, 31, 4, 1)$
$177: P_{6208} = (31, 0, 5, 1)$
$178: P_{6230} = (21, 1, 5, 1)$
$179: P_{6259} = (18, 2, 5, 1)$
$180: P_{6288} = (15, 3, 5, 1)$
$181: P_{6375} = (6, 6, 5, 1)$
$182: P_{6421} = (20, 7, 5, 1)$
$183: P_{6460} = (27, 8, 5, 1)$
$184: P_{6489} = (24, 9, 5, 1)$
$185: P_{6522} = (25, 10, 5, 1)$
$186: P_{6549} = (20, 11, 5, 1)$
$187: P_{6581} = (20, 12, 5, 1)$
$188: P_{6612} = (19, 13, 5, 1)$
$189: P_{6642} = (17, 14, 5, 1)$
$190: P_{6659} = (2, 15, 5, 1)$
$191: P_{6714} = (25, 16, 5, 1)$
$192: P_{6752} = (31, 17, 5, 1)$
$193: P_{6759} = (6, 18, 5, 1)$
$194: P_{6802} = (17, 19, 5, 1)$
$195: P_{6823} = (6, 20, 5, 1)$
$196: P_{6868} = (19, 21, 5, 1)$
$197: P_{6883} = (2, 22, 5, 1)$
$198: P_{6964} = (19, 24, 5, 1)$
$199: P_{6979} = (2, 25, 5, 1)$
$200: P_{7034} = (25, 26, 5, 1)$
$201: P_{7064} = (23, 27, 5, 1)$
$202: P_{7082} = (9, 28, 5, 1)$
$203: P_{7122} = (17, 29, 5, 1)$
$204: P_{7163} = (26, 30, 5, 1)$
$205: P_{7199} = (30, 31, 5, 1)$
$206: P_{7224} = (23, 0, 6, 1)$
$207: P_{7252} = (19, 1, 6, 1)$
$208: P_{7285} = (20, 2, 6, 1)$
$209: P_{7322} = (25, 3, 6, 1)$
$210: P_{7341} = (12, 4, 6, 1)$
$211: P_{7367} = (6, 5, 6, 1)$
$212: P_{7459} = (2, 8, 6, 1)$
$213: P_{7517} = (28, 9, 6, 1)$
$214: P_{7540} = (19, 10, 6, 1)$
$215: P_{7572} = (19, 11, 6, 1)$
$216: P_{7601} = (16, 12, 6, 1)$
$217: P_{7632} = (15, 13, 6, 1)$
$218: P_{7699} = (18, 15, 6, 1)$
$219: P_{7741} = (28, 16, 6, 1)$
$220: P_{7749} = (4, 17, 6, 1)$
$221: P_{7795} = (18, 18, 6, 1)$
$222: P_{7838} = (29, 19, 6, 1)$
$223: P_{7864} = (23, 20, 6, 1)$
$224: P_{7893} = (20, 21, 6, 1)$
$225: P_{7920} = (15, 22, 6, 1)$
$226: P_{7957} = (20, 23, 6, 1)$
$227: P_{7979} = (10, 24, 6, 1)$
$228: P_{8029} = (28, 25, 6, 1)$
$229: P_{8036} = (3, 26, 6, 1)$
$230: P_{8080} = (15, 27, 6, 1)$
$231: P_{8118} = (21, 28, 6, 1)$
$232: P_{8147} = (18, 29, 6, 1)$
$233: P_{8172} = (11, 30, 6, 1)$
$234: P_{8206} = (13, 31, 6, 1)$
$235: P_{8229} = (4, 0, 7, 1)$
$236: P_{8276} = (19, 1, 7, 1)$
$237: P_{8311} = (22, 2, 7, 1)$
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644 : $P_{22675} = (18, 3, 21, 1)$
645 : $P_{22714} = (25, 4, 21, 1)$
646 : $P_{22740} = (19, 5, 21, 1)$
647 : $P_{22773} = (20, 6, 21, 1)$
648 : $P_{22789} = (4, 7, 21, 1)$
649 : $P_{22844} = (27, 8, 21, 1)$
650 : $P_{22873} = (24, 9, 21, 1)$
651 : $P_{22902} = (21, 10, 21, 1)$
652 : $P_{22924} = (11, 11, 21, 1)$
653 : $P_{22955} = (10, 12, 21, 1)$
654 : $P_{23000} = (23, 13, 21, 1)$
655 : $P_{23039} = (30, 14, 21, 1)$
656 : $P_{23053} = (12, 15, 21, 1)$
657 : $P_{23084} = (11, 16, 21, 1)$
658 : $P_{23134} = (29, 17, 21, 1)$
659 : $P_{23162} = (25, 18, 21, 1)$
660 : $P_{23199} = (30, 19, 21, 1)$
661 : $P_{23290} = (25, 22, 21, 1)$
662 : $P_{23319} = (22, 23, 21, 1)$
663 : $P_{23349} = (20, 24, 21, 1)$
664 : $P_{23368} = (7, 25, 21, 1)$
665 : $P_{23436} = (11, 27, 21, 1)$
666 : $P_{23473} = (16, 28, 21, 1)$
667 : $P_{23519} = (30, 29, 21, 1)$
668 : $P_{23541} = (20, 30, 21, 1)$
669 : $P_{23567} = (14, 31, 21, 1)$
670 : $P_{23606} = (21, 0, 22, 1)$
671 : $P_{23631} = (14, 1, 22, 1)$
672 : $P_{23656} = (7, 2, 22, 1)$
673 : $P_{23708} = (27, 3, 22, 1)$
674 : $P_{23722} = (9, 4, 22, 1)$
675 : $P_{23747} = (2, 5, 22, 1)$
676 : $P_{23792} = (15, 6, 22, 1)$
677 : $P_{23833} = (24, 7, 22, 1)$
678 : $P_{23888} = (15, 9, 22, 1)$
679 : $P_{23923} = (18, 10, 22, 1)$
680 : $P_{23941} = (4, 11, 22, 1)$
681 : $P_{23998} = (29, 12, 22, 1)$
682 : $P_{24026} = (25, 13, 22, 1)$
683 : $P_{24039} = (6, 14, 22, 1)$
684 : $P_{24080} = (15, 15, 22, 1)$
685 : $P_{24106} = (9, 16, 22, 1)$
686 : $P_{24141} = (12, 17, 22, 1)$
687 : $P_{24175} = (14, 18, 22, 1)$
688 : $P_{24207} = (14, 19, 22, 1)$
689 : $P_{24234} = (9, 20, 22, 1)$
690 : $P_{24282} = (25, 21, 22, 1)$
691 : $P_{24378} = (25, 24, 22, 1)$

692 : $P_{24406} = (21, 25, 22, 1)$
693 : $P_{24439} = (22, 26, 22, 1)$
694 : $P_{24454} = (5, 27, 22, 1)$
695 : $P_{24500} = (19, 28, 22, 1)$
696 : $P_{24520} = (7, 29, 22, 1)$
697 : $P_{24558} = (13, 30, 22, 1)$
698 : $P_{24584} = (7, 31, 22, 1)$
699 : $P_{24636} = (27, 0, 23, 1)$
700 : $P_{24655} = (14, 1, 23, 1)$
701 : $P_{24680} = (7, 2, 23, 1)$
702 : $P_{24735} = (30, 3, 23, 1)$
703 : $P_{24768} = (31, 4, 23, 1)$
704 : $P_{24821} = (20, 6, 23, 1)$
705 : $P_{24839} = (6, 7, 23, 1)$
706 : $P_{24887} = (22, 8, 23, 1)$
707 : $P_{24916} = (19, 9, 23, 1)$
708 : $P_{24937} = (8, 10, 23, 1)$
709 : $P_{24981} = (20, 11, 23, 1)$
710 : $P_{25003} = (10, 12, 23, 1)$
711 : $P_{25045} = (20, 13, 23, 1)$
712 : $P_{25061} = (4, 14, 23, 1)$
713 : $P_{25110} = (21, 15, 23, 1)$
714 : $P_{25126} = (5, 16, 23, 1)$
715 : $P_{25164} = (11, 17, 23, 1)$
716 : $P_{25188} = (3, 18, 23, 1)$
717 : $P_{25225} = (8, 19, 23, 1)$
718 : $P_{25277} = (28, 20, 23, 1)$
719 : $P_{25303} = (22, 21, 23, 1)$
720 : $P_{25404} = (27, 24, 23, 1)$
721 : $P_{25417} = (8, 25, 23, 1)$
722 : $P_{25466} = (25, 26, 23, 1)$
723 : $P_{25504} = (31, 27, 23, 1)$
724 : $P_{25518} = (13, 28, 23, 1)$
725 : $P_{25559} = (22, 29, 23, 1)$
726 : $P_{25592} = (23, 30, 23, 1)$
727 : $P_{25632} = (31, 31, 23, 1)$
728 : $P_{25635} = (2, 0, 24, 1)$
729 : $P_{25695} = (30, 1, 24, 1)$
730 : $P_{25715} = (18, 2, 24, 1)$
731 : $P_{25735} = (6, 3, 24, 1)$
732 : $P_{25782} = (21, 4, 24, 1)$
733 : $P_{25812} = (19, 5, 24, 1)$
734 : $P_{25835} = (10, 6, 24, 1)$
735 : $P_{25859} = (2, 7, 24, 1)$
736 : $P_{25899} = (10, 8, 24, 1)$
737 : $P_{25926} = (5, 9, 24, 1)$
738 : $P_{25978} = (25, 10, 24, 1)$
739 : $P_{25993} = (8, 11, 24, 1)$
740 : $P_{26032} = (15, 12, 24, 1)$
741 : $P_{26066} = (17, 13, 24, 1)$
742 : $P_{26091} = (10, 14, 24, 1)$
743 : $P_{26142} = (29, 15, 24, 1)$
744 : $P_{26163} = (18, 16, 24, 1)$
745 : $P_{26227} = (18, 18, 24, 1)$
746 : $P_{26265} = (24, 19, 24, 1)$
747 : $P_{26302} = (29, 20, 24, 1)$
748 : $P_{26325} = (20, 21, 24, 1)$
749 : $P_{26362} = (25, 22, 24, 1)$
750 : $P_{26396} = (27, 23, 24, 1)$
751 : $P_{26479} = (14, 26, 24, 1)$
752 : $P_{26526} = (29, 27, 24, 1)$
753 : $P_{26554} = (25, 28, 24, 1)$
754 : $P_{26584} = (23, 29, 24, 1)$
755 : $P_{26609} = (16, 30, 24, 1)$
756 : $P_{26653} = (28, 31, 24, 1)$
757 : $P_{26685} = (28, 0, 25, 1)$
758 : $P_{26719} = (30, 1, 25, 1)$
759 : $P_{26738} = (17, 2, 25, 1)$
760 : $P_{26778} = (25, 3, 25, 1)$
761 : $P_{26806} = (21, 4, 25, 1)$
762 : $P_{26819} = (2, 5, 25, 1)$
763 : $P_{26877} = (28, 6, 25, 1)$
764 : $P_{26887} = (6, 7, 25, 1)$
765 : $P_{26943} = (30, 8, 25, 1)$
766 : $P_{26975} = (30, 9, 25, 1)$
767 : $P_{27040} = (31, 11, 25, 1)$
768 : $P_{27067} = (26, 12, 25, 1)$
769 : $P_{27084} = (11, 13, 25, 1)$
770 : $P_{27114} = (9, 14, 25, 1)$
771 : $P_{27153} = (16, 15, 25, 1)$
772 : $P_{27180} = (11, 16, 25, 1)$
773 : $P_{27205} = (4, 17, 25, 1)$
774 : $P_{27254} = (21, 18, 25, 1)$
775 : $P_{27292} = (27, 19, 25, 1)$
776 : $P_{27328} = (31, 20, 25, 1)$
777 : $P_{27336} = (7, 21, 25, 1)$
778 : $P_{27382} = (21, 22, 25, 1)$
779 : $P_{27401} = (8, 23, 25, 1)$
780 : $P_{27511} = (22, 26, 25, 1)$
781 : $P_{27527} = (6, 27, 25, 1)$
782 : $P_{27559} = (6, 28, 25, 1)$
783 : $P_{27596} = (11, 29, 25, 1)$
784 : $P_{27637} = (20, 30, 25, 1)$
785 : $P_{27680} = (31, 31, 25, 1)$
786 : $P_{27692} = (11, 0, 26, 1)$
787 : $P_{27737} = (24, 1, 26, 1)$
788 : $P_{27774} = (29, 2, 26, 1)$
789 : $P_{27788} = (11, 3, 26, 1)$
790 : $P_{27823} = (14, 4, 26, 1)$
791 : $P_{27866} = (25, 5, 26, 1)$
792 : $P_{27876} = (3, 6, 26, 1)$
793 : $P_{27936} = (31, 7, 26, 1)$
794 : $P_{27940} = (3, 8, 26, 1)$
795 : $P_{27982} = (13, 9, 26, 1)$
796 : $P_{28018} = (17, 10, 26, 1)$
797 : $P_{28043} = (10, 11, 26, 1)$
798 : $P_{28074} = (9, 12, 26, 1)$
799 : $P_{28112} = (15, 13, 26, 1)$

800 : $P_{28132} = (3, 14, 26, 1)$
801 : $P_{28183} = (22, 15, 26, 1)$
802 : $P_{28214} = (21, 16, 26, 1)$
803 : $P_{28254} = (29, 17, 26, 1)$
804 : $P_{28282} = (25, 18, 26, 1)$
805 : $P_{28318} = (29, 19, 26, 1)$
806 : $P_{28334} = (13, 20, 26, 1)$
807 : $P_{28407} = (22, 22, 26, 1)$
808 : $P_{28442} = (25, 23, 26, 1)$
809 : $P_{28463} = (14, 24, 26, 1)$
810 : $P_{28503} = (22, 25, 26, 1)$
811 : $P_{28591} = (14, 28, 26, 1)$
812 : $P_{28622} = (13, 29, 26, 1)$
813 : $P_{28657} = (16, 30, 26, 1)$
814 : $P_{28701} = (28, 31, 26, 1)$
815 : $P_{28724} = (19, 0, 27, 1)$
816 : $P_{28761} = (24, 1, 27, 1)$
817 : $P_{28788} = (19, 2, 27, 1)$
818 : $P_{28832} = (31, 3, 27, 1)$
819 : $P_{28863} = (30, 4, 27, 1)$
820 : $P_{28888} = (23, 5, 27, 1)$
821 : $P_{28912} = (15, 6, 27, 1)$
822 : $P_{28941} = (12, 7, 27, 1)$
823 : $P_{28964} = (3, 8, 27, 1)$
824 : $P_{29023} = (30, 9, 27, 1)$
825 : $P_{29047} = (22, 10, 27, 1)$
826 : $P_{29075} = (18, 11, 27, 1)$
827 : $P_{29109} = (20, 12, 27, 1)$
828 : $P_{29151} = (30, 13, 27, 1)$
829 : $P_{29157} = (4, 14, 27, 1)$
830 : $P_{29206} = (21, 15, 27, 1)$
831 : $P_{29227} = (10, 16, 27, 1)$
832 : $P_{29257} = (8, 17, 27, 1)$
833 : $P_{29295} = (14, 18, 27, 1)$
834 : $P_{29330} = (17, 19, 27, 1)$
835 : $P_{29376} = (31, 20, 27, 1)$
836 : $P_{29388} = (11, 21, 27, 1)$
837 : $P_{29414} = (5, 22, 27, 1)$
838 : $P_{29472} = (31, 23, 27, 1)$
839 : $P_{29502} = (29, 24, 27, 1)$
840 : $P_{29511} = (6, 25, 27, 1)$
841 : $P_{29625} = (24, 28, 27, 1)$
842 : $P_{29657} = (24, 29, 27, 1)$
843 : $P_{29692} = (27, 30, 27, 1)$
844 : $P_{29742} = (13, 0, 28, 1)$
845 : $P_{29771} = (10, 1, 28, 1)$
846 : $P_{29808} = (15, 2, 28, 1)$
847 : $P_{29860} = (3, 4, 28, 1)$
848 : $P_{29898} = (9, 5, 28, 1)$
849 : $P_{29942} = (21, 6, 28, 1)$
850 : $P_{29982} = (29, 7, 28, 1)$
851 : $P_{30004} = (19, 8, 28, 1)$
852 : $P_{30023} = (6, 9, 28, 1)$
853 : $P_{30051} = (2, 10, 28, 1)$
854 : $P_{30088} = (7, 11, 28, 1)$
855 : $P_{30135} = (22, 12, 28, 1)$
856 : $P_{30160} = (15, 13, 28, 1)$
857 : $P_{30205} = (28, 14, 28, 1)$
858 : $P_{30224} = (15, 15, 28, 1)$
859 : $P_{30247} = (6, 16, 28, 1)$
860 : $P_{30281} = (8, 17, 28, 1)$
861 : $P_{30335} = (30, 18, 28, 1)$
862 : $P_{30366} = (29, 19, 28, 1)$
863 : $P_{30398} = (29, 20, 28, 1)$
864 : $P_{30417} = (16, 21, 28, 1)$
865 : $P_{30452} = (19, 22, 28, 1)$
866 : $P_{30478} = (13, 23, 28, 1)$
867 : $P_{30522} = (25, 24, 28, 1)$
868 : $P_{30535} = (6, 25, 28, 1)$
869 : $P_{30575} = (14, 26, 28, 1)$
870 : $P_{30617} = (24, 27, 28, 1)$
871 : $P_{30708} = (19, 30, 28, 1)$
872 : $P_{30747} = (26, 31, 28, 1)$
873 : $P_{30760} = (7, 0, 29, 1)$
874 : $P_{30795} = (10, 1, 29, 1)$
875 : $P_{30835} = (18, 2, 29, 1)$
876 : $P_{30876} = (27, 3, 29, 1)$
877 : $P_{30899} = (18, 4, 29, 1)$
878 : $P_{30930} = (17, 5, 29, 1)$
879 : $P_{30963} = (18, 6, 29, 1)$
880 : $P_{30999} = (22, 7, 29, 1)$
881 : $P_{31040} = (31, 8, 29, 1)$
882 : $P_{31043} = (2, 9, 29, 1)$
883 : $P_{31098} = (25, 10, 29, 1)$
884 : $P_{31116} = (11, 11, 29, 1)$
885 : $P_{31166} = (29, 12, 29, 1)$
886 : $P_{31172} = (3, 13, 29, 1)$
887 : $P_{31217} = (16, 14, 29, 1)$
888 : $P_{31257} = (24, 15, 29, 1)$
889 : $P_{31287} = (22, 16, 29, 1)$
890 : $P_{31317} = (20, 17, 29, 1)$
891 : $P_{31340} = (11, 18, 29, 1)$
892 : $P_{31417} = (24, 20, 29, 1)$
893 : $P_{31455} = (30, 21, 29, 1)$
894 : $P_{31464} = (7, 22, 29, 1)$
895 : $P_{31511} = (22, 23, 29, 1)$
896 : $P_{31544} = (23, 24, 29, 1)$
897 : $P_{31564} = (11, 25, 29, 1)$
898 : $P_{31598} = (13, 26, 29, 1)$
899 : $P_{31641} = (24, 27, 29, 1)$
900 : $P_{31723} = (10, 30, 29, 1)$
901 : $P_{31755} = (10, 31, 29, 1)$
902 : $P_{31794} = (17, 0, 30, 1)$
903 : $P_{31821} = (12, 1, 30, 1)$
904 : $P_{31857} = (16, 2, 30, 1)$
905 : $P_{31878} = (5, 3, 30, 1)$
906 : $P_{31911} = (6, 4, 30, 1)$
907 : $P_{31963} = (26, 5, 30, 1)$

908 : $P_{31980} = (11, 6, 30, 1)$
909 : $P_{32015} = (14, 7, 30, 1)$
910 : $P_{32057} = (24, 8, 30, 1)$
911 : $P_{32076} = (11, 9, 30, 1)$
912 : $P_{32125} = (28, 10, 30, 1)$
913 : $P_{32132} = (3, 11, 30, 1)$
914 : $P_{32181} = (20, 12, 30, 1)$
915 : $P_{32198} = (5, 13, 30, 1)$
916 : $P_{32230} = (5, 14, 30, 1)$
917 : $P_{32268} = (11, 15, 30, 1)$
918 : $P_{32301} = (12, 16, 30, 1)$
919 : $P_{32333} = (12, 17, 30, 1)$
920 : $P_{32371} = (18, 18, 30, 1)$
921 : $P_{32402} = (17, 19, 30, 1)$
922 : $P_{32469} = (20, 21, 30, 1)$
923 : $P_{32494} = (13, 22, 30, 1)$
924 : $P_{32536} = (23, 23, 30, 1)$
925 : $P_{32561} = (16, 24, 30, 1)$
926 : $P_{32597} = (20, 25, 30, 1)$
927 : $P_{32625} = (16, 26, 30, 1)$
928 : $P_{32668} = (27, 27, 30, 1)$
929 : $P_{32692} = (19, 28, 30, 1)$
930 : $P_{32715} = (10, 29, 30, 1)$
931 : $P_{32830} = (29, 0, 31, 1)$
932 : $P_{32845} = (12, 1, 31, 1)$
933 : $P_{32893} = (28, 2, 31, 1)$
934 : $P_{32922} = (25, 3, 31, 1)$
935 : $P_{32940} = (11, 4, 31, 1)$
936 : $P_{32991} = (30, 5, 31, 1)$
937 : $P_{33006} = (13, 6, 31, 1)$
938 : $P_{33047} = (22, 7, 31, 1)$
939 : $P_{33074} = (17, 8, 31, 1)$
940 : $P_{33095} = (6, 9, 31, 1)$
941 : $P_{33139} = (18, 10, 31, 1)$
942 : $P_{33175} = (22, 11, 31, 1)$
943 : $P_{33207} = (22, 12, 31, 1)$
944 : $P_{33227} = (10, 13, 31, 1)$
945 : $P_{33280} = (31, 14, 31, 1)$
946 : $P_{33301} = (20, 15, 31, 1)$
947 : $P_{33323} = (10, 16, 31, 1)$
948 : $P_{33349} = (4, 17, 31, 1)$
949 : $P_{33406} = (29, 18, 31, 1)$
950 : $P_{33424} = (15, 19, 31, 1)$
951 : $P_{33450} = (9, 20, 31, 1)$
952 : $P_{33487} = (14, 21, 31, 1)$
953 : $P_{33512} = (7, 22, 31, 1)$
954 : $P_{33568} = (31, 23, 31, 1)$
955 : $P_{33597} = (28, 24, 31, 1)$
956 : $P_{33632} = (31, 25, 31, 1)$
957 : $P_{33661} = (28, 26, 31, 1)$
958 : $P_{33723} = (26, 28, 31, 1)$
959 : $P_{33739} = (10, 29, 31, 1)$

Line Intersection Graph

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

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1
in point	P_{2114}

Line 1 intersects

Line	ℓ_0	ℓ_2
in point	P_{2114}	P_{67}

Line 2 intersects

Line	ℓ_1
in point	P_{67}

The surface has 1057 points:
Too many to print.