Rank-74007 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

$$X_2^3 + X_0^2X_1 + X_1^2X_2 + X_0X_3^2 + X_0X_1X_2 = 0$$

(0, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is 1109428261

General information

Number of lines	3
Number of points	1089
Number of singular points	1
Number of Eckardt points	0
Number of double points	2
Number of single points	95
Number of points off lines	992
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^{992}

Singular Points

The surface has 1 singular points:

$0: \ P_{2114} = \mathbf{P}(0,1,1,1) = \mathbf{P}(0,1,1,1)$

The 3 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082400} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082400} = \mathbf{Pl}(0,0,0,1,0,0)_{65}$$

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

$$\ell_2 = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{34913} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{34913} = \mathbf{Pl}(1,1,0,1,1,1)_{69601}$$

Rank of lines: (1082400, 1082433, 34913)
Rank of points on Klein quadric: (65, 97, 69601)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

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

$P_3 = (0,0,0,1) = \ell_0 \cap \ell_1$
$P_{1090} = (0,1,0,1) = \ell_0 \cap \ell_2$

Single Points

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

0 : $P_1 = (0,1,0,0)$ lies on line ℓ_0
1 : $P_{67} = (0,1,1,0)$ lies on line ℓ_1
2 : $P_{68} = (1,1,1,0)$ lies on line ℓ_2
3 : $P_{1122} = (0,2,0,1)$ lies on line ℓ_0
4 : $P_{1154} = (0,3,0,1)$ lies on line ℓ_0
5 : $P_{1186} = (0,4,0,1)$ lies on line ℓ_0
6 : $P_{1218} = (0,5,0,1)$ lies on line ℓ_0
7 : $P_{1250} = (0,6,0,1)$ lies on line ℓ_0
8 : $P_{1282} = (0,7,0,1)$ lies on line ℓ_0
9 : $P_{1314} = (0,8,0,1)$ lies on line ℓ_0
10 : $P_{1346} = (0,9,0,1)$ lies on line ℓ_0
11 : $P_{1378} = (0,10,0,1)$ lies on line ℓ_0
12 : $P_{1410} = (0,11,0,1)$ lies on line ℓ_0
13 : $P_{1442} = (0,12,0,1)$ lies on line ℓ_0
14 : $P_{1474} = (0,13,0,1)$ lies on line ℓ_0
15 : $P_{1506} = (0,14,0,1)$ lies on line ℓ_0
16 : $P_{1538} = (0,15,0,1)$ lies on line ℓ_0
17 : $P_{1570} = (0,16,0,1)$ lies on line ℓ_0
18 : $P_{1602} = (0,17,0,1)$ lies on line ℓ_0
19 : $P_{1634} = (0,18,0,1)$ lies on line ℓ_0
20 : $P_{1666} = (0,19,0,1)$ lies on line ℓ_0
21 : $P_{1698} = (0,20,0,1)$ lies on line ℓ_0
22 : $P_{1730} = (0,21,0,1)$ lies on line ℓ_0
23 : $P_{1762} = (0,22,0,1)$ lies on line ℓ_0
24 : $P_{1794} = (0,23,0,1)$ lies on line ℓ_0
25 : $P_{1826} = (0,24,0,1)$ lies on line ℓ_0
26 : $P_{1858} = (0,25,0,1)$ lies on line ℓ_0
27 : $P_{1890} = (0,26,0,1)$ lies on line ℓ_0
28 : $P_{1922} = (0,27,0,1)$ lies on line ℓ_0
29 : $P_{1954} = (0,28,0,1)$ lies on line ℓ_0
30 : $P_{1986} = (0,29,0,1)$ lies on line ℓ_0
31 : $P_{2018} = (0,30,0,1)$ lies on line ℓ_0
32 : $P_{2050} = (0,31,0,1)$ lies on line ℓ_0
33 : $P_{2083} = (1,0,1,1)$ lies on line ℓ_2
34 : $P_{2114} = (0,1,1,1)$ lies on line ℓ_1
35 : $P_{3169} = (0,2,2,1)$ lies on line ℓ_1
36 : $P_{3203} = (2,3,2,1)$ lies on line ℓ_2
37 : $P_{4196} = (3,2,3,1)$ 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 : $P_{5317} = (4,5,4,1)$ lies on line ℓ_2
41 : $P_{6310} = (5,4,5,1)$ 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 : $P_{7431} = (6,7,6,1)$ lies on line ℓ_2
45 : $P_{8424} = (7,6,7,1)$ 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 : $P_{9545} = (8,9,8,1)$ lies on line ℓ_2
49 : $P_{10538} = (9,8,9,1)$ 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 : $P_{11659} = (10, 11, 10, 1)$ lies on line ℓ_2
53 : $P_{12652} = (11, 10, 11, 1)$ 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 : $P_{13773} = (12, 13, 12, 1)$ lies on line ℓ_2
57 : $P_{14766} = (13, 12, 13, 1)$ 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 : $P_{15887} = (14, 15, 14, 1)$ lies on line ℓ_2
61 : $P_{16880} = (15, 14, 15, 1)$ 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 : $P_{18001} = (16, 17, 16, 1)$ lies on line ℓ_2
65 : $P_{18994} = (17, 16, 17, 1)$ 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 : $P_{20115} = (18, 19, 18, 1)$ lies on line ℓ_2
69 : $P_{21108} = (19, 18, 19, 1)$ 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 : $P_{22229} = (20, 21, 20, 1)$ lies on line ℓ_2
73 : $P_{23222} = (21, 20, 21, 1)$ 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 : $P_{24343} = (22, 23, 22, 1)$ lies on line ℓ_2
77 : $P_{25336} = (23, 22, 23, 1)$ 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 : $P_{26457} = (24, 25, 24, 1)$ lies on line ℓ_2
81 : $P_{27450} = (25, 24, 25, 1)$ 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 : $P_{28571} = (26, 27, 26, 1)$ lies on line ℓ_2
85 : $P_{29564} = (27, 26, 27, 1)$ 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 : $P_{30685} = (28, 29, 28, 1)$ lies on line ℓ_2
89 : $P_{31678} = (29, 28, 29, 1)$ 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 : $P_{32799} = (30, 31, 30, 1)$ lies on line ℓ_2
93 : $P_{33792} = (31, 30, 31, 1)$ 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 992 points not on any line:
The points on the surface but not on lines are:

0 : $P_0 = (1, 0, 0, 0)$
1 : $P_{113} = (14, 2, 1, 0)$
2 : $P_{114} = (15, 2, 1, 0)$
3 : $P_{155} = (24, 3, 1, 0)$
4 : $P_{156} = (25, 3, 1, 0)$
5 : $P_{193} = (30, 4, 1, 0)$
6 : $P_{194} = (31, 4, 1, 0)$
7 : $P_{201} = (6, 5, 1, 0)$
8 : $P_{202} = (7, 5, 1, 0)$
9 : $P_{287} = (28, 7, 1, 0)$
10 : $P_{288} = (29, 7, 1, 0)$
11 : $P_{353} = (30, 9, 1, 0)$
12 : $P_{354} = (31, 9, 1, 0)$
13 : $P_{405} = (18, 11, 1, 0)$
14 : $P_{406} = (19, 11, 1, 0)$
15 : $P_{447} = (28, 12, 1, 0)$
16 : $P_{448} = (29, 12, 1, 0)$
17 : $P_{459} = (8, 13, 1, 0)$
18 : $P_{460} = (9, 13, 1, 0)$
19 : $P_{523} = (8, 15, 1, 0)$
20 : $P_{524} = (9, 15, 1, 0)$
21 : $P_{565} = (18, 16, 1, 0)$
22 : $P_{566} = (19, 16, 1, 0)$
23 : $P_{599} = (20, 17, 1, 0)$
24 : $P_{600} = (21, 17, 1, 0)$
25 : $P_{625} = (14, 18, 1, 0)$
26 : $P_{626} = (15, 18, 1, 0)$
27 : $P_{729} = (22, 21, 1, 0)$
28 : $P_{730} = (23, 21, 1, 0)$
29 : $P_{777} = (6, 23, 1, 0)$
30 : $P_{778} = (7, 23, 1, 0)$
31 : $P_{823} = (20, 24, 1, 0)$
32 : $P_{824} = (21, 24, 1, 0)$
33 : $P_{889} = (22, 26, 1, 0)$
34 : $P_{890} = (23, 26, 1, 0)$
35 : $P_{909} = (10, 27, 1, 0)$
36 : $P_{910} = (11, 27, 1, 0)$
37 : $P_{955} = (24, 28, 1, 0)$
38 : $P_{956} = (25, 28, 1, 0)$
39 : $P_{1037} = (10, 31, 1, 0)$
40 : $P_{1038} = (11, 31, 1, 0)$
41 : $P_{1091} = (1, 1, 0, 1)$
42 : $P_{1140} = (18, 2, 0, 1)$
43 : $P_{1182} = (28, 3, 0, 1)$

$44: P_{1195} = (9, 4, 0, 1)$
$45: P_{1241} = (23, 5, 0, 1)$
$46: P_{1264} = (14, 6, 0, 1)$
$47: P_{1294} = (12, 7, 0, 1)$
$48: P_{1336} = (22, 8, 0, 1)$
$49: P_{1350} = (4, 9, 0, 1)$
$50: P_{1403} = (25, 10, 0, 1)$
$51: P_{1426} = (16, 11, 0, 1)$
$52: P_{1449} = (7, 12, 0, 1)$
$53: P_{1489} = (15, 13, 0, 1)$
$54: P_{1512} = (6, 14, 0, 1)$
$55: P_{1551} = (13, 15, 0, 1)$
$56: P_{1581} = (11, 16, 0, 1)$
$57: P_{1626} = (24, 17, 0, 1)$
$58: P_{1636} = (2, 18, 0, 1)$
$59: P_{1695} = (29, 19, 0, 1)$
$60: P_{1728} = (30, 20, 0, 1)$
$61: P_{1756} = (26, 21, 0, 1)$
$62: P_{1770} = (8, 22, 0, 1)$
$63: P_{1799} = (5, 23, 0, 1)$
$64: P_{1843} = (17, 24, 0, 1)$
$65: P_{1868} = (10, 25, 0, 1)$
$66: P_{1911} = (21, 26, 0, 1)$
$67: P_{1953} = (31, 27, 0, 1)$
$68: P_{1957} = (3, 28, 0, 1)$
$69: P_{2005} = (19, 29, 0, 1)$
$70: P_{2038} = (20, 30, 0, 1)$
$71: P_{2077} = (27, 31, 0, 1)$
$72: P_{2157} = (12, 2, 1, 1)$
$73: P_{2176} = (31, 2, 1, 1)$
$74: P_{2227} = (18, 4, 1, 1)$
$75: P_{2235} = (26, 4, 1, 1)$
$76: P_{2290} = (17, 6, 1, 1)$
$77: P_{2303} = (30, 6, 1, 1)$
$78: P_{2380} = (11, 9, 1, 1)$
$79: P_{2383} = (14, 9, 1, 1)$
$80: P_{2448} = (15, 11, 1, 1)$
$81: P_{2463} = (30, 11, 1, 1)$
$82: P_{2502} = (5, 13, 1, 1)$
$83: P_{2508} = (11, 13, 1, 1)$
$84: P_{2580} = (19, 15, 1, 1)$
$85: P_{2592} = (31, 15, 1, 1)$
$86: P_{2596} = (3, 16, 1, 1)$
$87: P_{2602} = (9, 16, 1, 1)$
$88: P_{2666} = (9, 18, 1, 1)$
$89: P_{2667} = (10, 18, 1, 1)$
$90: P_{2733} = (12, 20, 1, 1)$
$91: P_{2740} = (19, 20, 1, 1)$
$92: P_{2788} = (3, 22, 1, 1)$
$93: P_{2795} = (10, 22, 1, 1)$
$94: P_{2886} = (5, 25, 1, 1)$
$95: P_{2895} = (14, 25, 1, 1)$
$96: P_{2960} = (15, 27, 1, 1)$
$97: P_{2962} = (17, 27, 1, 1)$
$98: P_{3017} = (8, 29, 1, 1)$
$99: P_{3035} = (26, 29, 1, 1)$
$100: P_{3081} = (8, 31, 1, 1)$
$101: P_{3091} = (18, 31, 1, 1)$
$102: P_{3113} = (8, 0, 2, 1)$
$103: P_{3161} = (24, 1, 2, 1)$
$104: P_{3164} = (27, 1, 2, 1)$
$105: P_{3185} = (16, 2, 2, 1)$
$106: P_{3229} = (28, 3, 2, 1)$
$107: P_{3234} = (1, 4, 2, 1)$
$108: P_{3243} = (10, 4, 2, 1)$
$109: P_{3313} = (16, 6, 2, 1)$
$110: P_{3325} = (28, 6, 2, 1)$
$111: P_{3348} = (19, 7, 2, 1)$
$112: P_{3358} = (29, 7, 2, 1)$
$113: P_{3373} = (12, 8, 2, 1)$
$114: P_{3385} = (24, 8, 2, 1)$
$115: P_{3403} = (10, 9, 2, 1)$
$116: P_{3405} = (12, 9, 2, 1)$
$117: P_{3526} = (5, 13, 2, 1)$
$118: P_{3529} = (8, 13, 2, 1)$
$119: P_{3556} = (3, 14, 2, 1)$
$120: P_{3560} = (7, 14, 2, 1)$
$121: P_{3636} = (19, 16, 2, 1)$
$122: P_{3643} = (26, 16, 2, 1)$
$123: P_{3656} = (7, 17, 2, 1)$
$124: P_{3678} = (29, 17, 2, 1)$
$125: P_{3686} = (5, 18, 2, 1)$
$126: P_{3842} = (1, 23, 2, 1)$
$127: P_{3847} = (6, 23, 2, 1)$
$128: P_{3923} = (18, 25, 2, 1)$
$129: P_{3931} = (26, 25, 2, 1)$
$130: P_{3975} = (6, 27, 2, 1)$
$131: P_{3996} = (27, 27, 2, 1)$
$132: P_{4036} = (3, 29, 2, 1)$
$133: P_{4051} = (18, 29, 2, 1)$
$134: P_{4144} = (15, 0, 3, 1)$
$135: P_{4211} = (18, 2, 3, 1)$
$136: P_{4256} = (31, 3, 3, 1)$
$137: P_{4358} = (5, 7, 3, 1)$
$138: P_{4363} = (10, 7, 3, 1)$
$139: P_{4386} = (1, 8, 3, 1)$
$140: P_{4405} = (20, 8, 3, 1)$
$141: P_{4485} = (4, 11, 3, 1)$
$142: P_{4504} = (23, 11, 3, 1)$
$143: P_{4550} = (5, 13, 3, 1)$
$144: P_{4554} = (9, 13, 3, 1)$
$145: P_{4735} = (30, 18, 3, 1)$
$146: P_{4736} = (31, 18, 3, 1)$
$147: P_{4743} = (6, 19, 3, 1)$
$148: P_{4761} = (24, 19, 3, 1)$
$149: P_{4779} = (10, 20, 3, 1)$
$150: P_{4792} = (23, 20, 3, 1)$
$151: P_{4802} = (1, 21, 3, 1)$

$152: P_{4825} = (24, 21, 3, 1)$
$153: P_{4883} = (18, 23, 3, 1)$
$154: P_{4885} = (20, 23, 3, 1)$
$155: P_{4935} = (6, 25, 3, 1)$
$156: P_{4944} = (15, 25, 3, 1)$
$157: P_{5029} = (4, 28, 3, 1)$
$158: P_{5098} = (9, 30, 3, 1)$
$159: P_{5119} = (30, 30, 3, 1)$
$160: P_{5163} = (10, 0, 4, 1)$
$161: P_{5187} = (2, 1, 4, 1)$
$162: P_{5192} = (7, 1, 4, 1)$
$163: P_{5219} = (2, 2, 4, 1)$
$164: P_{5237} = (20, 2, 4, 1)$
$165: P_{5294} = (13, 4, 4, 1)$
$166: P_{5336} = (23, 5, 4, 1)$
$167: P_{5348} = (3, 6, 4, 1)$
$168: P_{5354} = (9, 6, 4, 1)$
$169: P_{5458} = (17, 9, 4, 1)$
$170: P_{5480} = (7, 10, 4, 1)$
$171: P_{5499} = (26, 10, 4, 1)$
$172: P_{5519} = (14, 11, 4, 1)$
$173: P_{5531} = (26, 11, 4, 1)$
$174: P_{5558} = (21, 12, 4, 1)$
$175: P_{5559} = (22, 12, 4, 1)$
$176: P_{5572} = (3, 13, 4, 1)$
$177: P_{5577} = (8, 13, 4, 1)$
$178: P_{5666} = (1, 16, 4, 1)$
$179: P_{5679} = (14, 16, 4, 1)$
$180: P_{5806} = (13, 20, 4, 1)$
$181: P_{5816} = (23, 20, 4, 1)$
$182: P_{5833} = (8, 21, 4, 1)$
$183: P_{5847} = (22, 21, 4, 1)$
$184: P_{5862} = (5, 22, 4, 1)$
$185: P_{5866} = (9, 22, 4, 1)$
$186: P_{5922} = (1, 24, 4, 1)$
$187: P_{5941} = (20, 24, 4, 1)$
$188: P_{6027} = (10, 27, 4, 1)$
$189: P_{6034} = (17, 27, 4, 1)$
$190: P_{6118} = (5, 30, 4, 1)$
$191: P_{6134} = (21, 30, 4, 1)$
$192: P_{6208} = (31, 0, 5, 1)$
$193: P_{6314} = (9, 4, 5, 1)$
$194: P_{6355} = (18, 5, 5, 1)$
$195: P_{6389} = (20, 6, 5, 1)$
$196: P_{6400} = (31, 6, 5, 1)$
$197: P_{6440} = (7, 8, 5, 1)$
$198: P_{6453} = (20, 8, 5, 1)$
$199: P_{6483} = (18, 9, 5, 1)$
$200: P_{6484} = (19, 9, 5, 1)$
$201: P_{6498} = (1, 10, 5, 1)$
$202: P_{6526} = (29, 10, 5, 1)$
$203: P_{6673} = (16, 15, 5, 1)$
$204: P_{6681} = (24, 15, 5, 1)$
$205: P_{6796} = (11, 19, 5, 1)$
$206: P_{6804} = (19, 19, 5, 1)$
$207: P_{6863} = (14, 21, 5, 1)$
$208: P_{6866} = (17, 21, 5, 1)$
$209: P_{6929} = (16, 23, 5, 1)$
$210: P_{6954} = (9, 24, 5, 1)$
$211: P_{6974} = (29, 24, 5, 1)$
$212: P_{7052} = (11, 27, 5, 1)$
$213: P_{7058} = (17, 27, 5, 1)$
$214: P_{7074} = (1, 28, 5, 1)$
$215: P_{7080} = (7, 28, 5, 1)$
$216: P_{7119} = (14, 29, 5, 1)$
$217: P_{7129} = (24, 29, 5, 1)$
$218: P_{7224} = (23, 0, 6, 1)$
$219: P_{7242} = (9, 1, 6, 1)$
$220: P_{7247} = (14, 1, 6, 1)$
$221: P_{7266} = (1, 2, 6, 1)$
$222: P_{7286} = (21, 2, 6, 1)$
$223: P_{7345} = (16, 4, 6, 1)$
$224: P_{7360} = (31, 4, 6, 1)$
$225: P_{7370} = (9, 5, 6, 1)$
$226: P_{7385} = (24, 5, 6, 1)$
$227: P_{7401} = (8, 6, 6, 1)$
$228: P_{7437} = (12, 7, 6, 1)$
$229: P_{7461} = (4, 8, 6, 1)$
$230: P_{7477} = (20, 8, 6, 1)$
$231: P_{7535} = (14, 10, 6, 1)$
$232: P_{7538} = (17, 10, 6, 1)$
$233: P_{7555} = (2, 11, 6, 1)$
$234: P_{7573} = (20, 11, 6, 1)$
$235: P_{7618} = (1, 13, 6, 1)$
$236: P_{7625} = (8, 13, 6, 1)$
$237: P_{7670} = (21, 14, 6, 1)$
$238: P_{7801} = (24, 18, 6, 1)$
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645 : $P_{22088} = (7, 17, 20, 1)$
646 : $P_{22092} = (11, 17, 20, 1)$
647 : $P_{22167} = (22, 19, 20, 1)$
648 : $P_{22176} = (31, 19, 20, 1)$
649 : $P_{22187} = (10, 20, 20, 1)$
650 : $P_{22235} = (26, 21, 20, 1)$
651 : $P_{22276} = (3, 23, 20, 1)$
652 : $P_{22291} = (18, 23, 20, 1)$
653 : $P_{22321} = (16, 24, 20, 1)$
654 : $P_{22326} = (21, 24, 20, 1)$
655 : $P_{22402} = (1, 27, 20, 1)$
656 : $P_{22411} = (10, 27, 20, 1)$
657 : $P_{22468} = (3, 29, 20, 1)$
658 : $P_{22469} = (4, 29, 20, 1)$
659 : $P_{22525} = (28, 30, 20, 1)$
660 : $P_{22577} = (16, 0, 21, 1)$
661 : $P_{22673} = (16, 3, 21, 1)$
662 : $P_{22682} = (25, 3, 21, 1)$
663 : $P_{22704} = (15, 4, 21, 1)$
664 : $P_{22708} = (19, 4, 21, 1)$
665 : $P_{22730} = (9, 5, 21, 1)$
666 : $P_{22732} = (11, 5, 21, 1)$
667 : $P_{22858} = (9, 9, 21, 1)$
668 : $P_{22873} = (24, 9, 21, 1)$
669 : $P_{22915} = (2, 11, 21, 1)$
670 : $P_{22920} = (7, 11, 21, 1)$
671 : $P_{22956} = (11, 12, 21, 1)$
672 : $P_{22970} = (25, 12, 21, 1)$
673 : $P_{22984} = (7, 13, 21, 1)$
674 : $P_{23006} = (29, 13, 21, 1)$
675 : $P_{23011} = (2, 14, 21, 1)$
676 : $P_{23026} = (17, 14, 21, 1)$
677 : $P_{23231} = (30, 20, 21, 1)$
678 : $P_{23248} = (15, 21, 21, 1)$
679 : $P_{23277} = (12, 22, 21, 1)$
680 : $P_{23282} = (17, 22, 21, 1)$
681 : $P_{23373} = (12, 25, 21, 1)$
682 : $P_{23380} = (19, 25, 21, 1)$
683 : $P_{23422} = (29, 26, 21, 1)$
684 : $P_{23513} = (24, 29, 21, 1)$
685 : $P_{23519} = (30, 29, 21, 1)$
686 : $P_{23606} = (21, 0, 22, 1)$
687 : $P_{23625} = (8, 1, 22, 1)$
688 : $P_{23648} = (31, 1, 22, 1)$
689 : $P_{23714} = (1, 4, 22, 1)$
690 : $P_{23743} = (30, 4, 22, 1)$
691 : $P_{23820} = (11, 7, 22, 1)$

692 : $P_{23826} = (17, 7, 22, 1)$
693 : $P_{23865} = (24, 8, 22, 1)$
694 : $P_{23911} = (6, 10, 22, 1)$
695 : $P_{23914} = (9, 10, 22, 1)$
696 : $P_{24002} = (1, 13, 22, 1)$
697 : $P_{24025} = (24, 13, 22, 1)$
698 : $P_{24038} = (5, 14, 22, 1)$
699 : $P_{24054} = (21, 14, 22, 1)$
700 : $P_{24072} = (7, 15, 22, 1)$
701 : $P_{24093} = (28, 15, 22, 1)$
702 : $P_{24136} = (7, 17, 22, 1)$
703 : $P_{24138} = (9, 17, 22, 1)$
704 : $P_{24174} = (13, 18, 22, 1)$
705 : $P_{24186} = (25, 18, 22, 1)$
706 : $P_{24196} = (3, 19, 22, 1)$
707 : $P_{24201} = (8, 19, 22, 1)$
708 : $P_{24280} = (23, 21, 22, 1)$
709 : $P_{24284} = (27, 21, 22, 1)$
710 : $P_{24319} = (30, 22, 22, 1)$
711 : $P_{24326} = (5, 23, 22, 1)$
712 : $P_{24398} = (13, 25, 22, 1)$
713 : $P_{24402} = (17, 25, 22, 1)$
714 : $P_{24445} = (28, 26, 22, 1)$
715 : $P_{24448} = (31, 26, 22, 1)$
716 : $P_{24451} = (2, 27, 22, 1)$
717 : $P_{24460} = (11, 27, 22, 1)$
718 : $P_{24483} = (2, 28, 22, 1)$
719 : $P_{24504} = (23, 28, 22, 1)$
720 : $P_{24516} = (3, 29, 22, 1)$
721 : $P_{24519} = (6, 29, 22, 1)$
722 : $P_{24570} = (25, 30, 22, 1)$
723 : $P_{24572} = (27, 30, 22, 1)$
724 : $P_{24636} = (27, 0, 23, 1)$
725 : $P_{24698} = (25, 2, 23, 1)$
726 : $P_{24701} = (28, 2, 23, 1)$
727 : $P_{24725} = (20, 3, 23, 1)$
728 : $P_{24736} = (31, 3, 23, 1)$
729 : $P_{24794} = (25, 5, 23, 1)$
730 : $P_{24804} = (3, 6, 23, 1)$
731 : $P_{24827} = (26, 6, 23, 1)$
732 : $P_{25008} = (15, 12, 23, 1)$
733 : $P_{25024} = (31, 12, 23, 1)$
734 : $P_{25035} = (10, 13, 23, 1)$
735 : $P_{25043} = (18, 13, 23, 1)$
736 : $P_{25104} = (15, 15, 23, 1)$
737 : $P_{25110} = (21, 15, 23, 1)$
738 : $P_{25173} = (20, 17, 23, 1)$
739 : $P_{25180} = (27, 17, 23, 1)$
740 : $P_{25233} = (16, 19, 23, 1)$
741 : $P_{25243} = (26, 19, 23, 1)$
742 : $P_{25252} = (3, 20, 23, 1)$
743 : $P_{25259} = (10, 20, 23, 1)$
744 : $P_{25321} = (8, 22, 23, 1)$
745 : $P_{25363} = (18, 23, 23, 1)$
746 : $P_{25417} = (8, 25, 23, 1)$
747 : $P_{25430} = (21, 25, 23, 1)$
748 : $P_{25617} = (16, 31, 23, 1)$
749 : $P_{25629} = (28, 31, 23, 1)$
750 : $P_{25635} = (2, 0, 24, 1)$
751 : $P_{25767} = (6, 4, 24, 1)$
752 : $P_{25784} = (23, 4, 24, 1)$
753 : $P_{25811} = (18, 5, 24, 1)$
754 : $P_{25822} = (29, 5, 24, 1)$
755 : $P_{25835} = (10, 6, 24, 1)$
756 : $P_{25853} = (28, 6, 24, 1)$
757 : $P_{25892} = (3, 8, 24, 1)$
758 : $P_{25902} = (13, 8, 24, 1)$
759 : $P_{26019} = (2, 12, 24, 1)$
760 : $P_{26046} = (29, 12, 24, 1)$
761 : $P_{26183} = (6, 17, 24, 1)$
762 : $P_{26222} = (13, 18, 24, 1)$
763 : $P_{26232} = (23, 18, 24, 1)$
764 : $P_{26276} = (3, 20, 24, 1)$
765 : $P_{26278} = (5, 20, 24, 1)$
766 : $P_{26410} = (9, 24, 24, 1)$
767 : $P_{26443} = (10, 25, 24, 1)$
768 : $P_{26483} = (18, 26, 24, 1)$
769 : $P_{26496} = (31, 26, 24, 1)$
770 : $P_{26506} = (9, 27, 24, 1)$
771 : $P_{26511} = (14, 27, 24, 1)$
772 : $P_{26566} = (5, 29, 24, 1)$
773 : $P_{26575} = (14, 29, 24, 1)$
774 : $P_{26653} = (28, 31, 24, 1)$
775 : $P_{26656} = (31, 31, 24, 1)$
776 : $P_{26685} = (28, 0, 25, 1)$
777 : $P_{26699} = (10, 1, 25, 1)$
778 : $P_{26707} = (18, 1, 25, 1)$
779 : $P_{26725} = (4, 2, 25, 1)$
780 : $P_{26736} = (15, 2, 25, 1)$
781 : $P_{26771} = (18, 3, 25, 1)$
782 : $P_{26776} = (23, 3, 25, 1)$
783 : $P_{26861} = (12, 6, 25, 1)$
784 : $P_{26876} = (27, 6, 25, 1)$
785 : $P_{26918} = (5, 8, 25, 1)$
786 : $P_{26923} = (10, 8, 25, 1)$
787 : $P_{26951} = (6, 9, 25, 1)$
788 : $P_{26972} = (27, 9, 25, 1)$
789 : $P_{26984} = (7, 10, 25, 1)$
790 : $P_{27052} = (11, 12, 25, 1)$
791 : $P_{27062} = (21, 12, 25, 1)$
792 : $P_{27116} = (11, 14, 25, 1)$
793 : $P_{27125} = (20, 14, 25, 1)$
794 : $P_{27170} = (1, 16, 25, 1)$
795 : $P_{27188} = (19, 16, 25, 1)$
796 : $P_{27267} = (2, 19, 25, 1)$
797 : $P_{27271} = (6, 19, 25, 1)$
798 : $P_{27341} = (12, 21, 25, 1)$
799 : $P_{27344} = (15, 21, 25, 1)$

800 : $P_{27366} = (5, 22, 25, 1)$
801 : $P_{27381} = (20, 22, 25, 1)$
802 : $P_{27397} = (4, 23, 25, 1)$
803 : $P_{27417} = (24, 23, 25, 1)$
804 : $P_{27442} = (17, 24, 25, 1)$
805 : $P_{27476} = (19, 25, 25, 1)$
806 : $P_{27522} = (1, 27, 25, 1)$
807 : $P_{27528} = (7, 27, 25, 1)$
808 : $P_{27555} = (2, 28, 25, 1)$
809 : $P_{27577} = (24, 28, 25, 1)$
810 : $P_{27634} = (17, 30, 25, 1)$
811 : $P_{27645} = (28, 30, 25, 1)$
812 : $P_{27670} = (21, 31, 25, 1)$
813 : $P_{27672} = (23, 31, 25, 1)$
814 : $P_{27692} = (11, 0, 26, 1)$
815 : $P_{27881} = (8, 6, 26, 1)$
816 : $P_{27901} = (28, 6, 26, 1)$
817 : $P_{27906} = (1, 7, 26, 1)$
818 : $P_{27928} = (23, 7, 26, 1)$
819 : $P_{27971} = (2, 9, 26, 1)$
820 : $P_{27997} = (28, 9, 26, 1)$
821 : $P_{28143} = (14, 14, 26, 1)$
822 : $P_{28147} = (18, 14, 26, 1)$
823 : $P_{28196} = (3, 16, 26, 1)$
824 : $P_{28211} = (18, 16, 26, 1)$
825 : $P_{28290} = (1, 19, 26, 1)$
826 : $P_{28295} = (6, 19, 26, 1)$
827 : $P_{28355} = (2, 21, 26, 1)$
828 : $P_{28396} = (11, 22, 26, 1)$
829 : $P_{28410} = (25, 22, 26, 1)$
830 : $P_{28452} = (3, 24, 26, 1)$
831 : $P_{28457} = (8, 24, 26, 1)$
832 : $P_{28528} = (15, 26, 26, 1)$
833 : $P_{28576} = (31, 27, 26, 1)$
834 : $P_{28583} = (6, 28, 26, 1)$
835 : $P_{28608} = (31, 28, 26, 1)$
836 : $P_{28664} = (23, 30, 26, 1)$
837 : $P_{28666} = (25, 30, 26, 1)$
838 : $P_{28687} = (14, 31, 26, 1)$
839 : $P_{28688} = (15, 31, 26, 1)$
840 : $P_{28724} = (19, 0, 27, 1)$
841 : $P_{28750} = (13, 1, 27, 1)$
842 : $P_{28760} = (23, 1, 27, 1)$
843 : $P_{28770} = (1, 2, 27, 1)$
844 : $P_{28777} = (8, 2, 27, 1)$
845 : $P_{28845} = (12, 4, 27, 1)$
846 : $P_{28863} = (30, 4, 27, 1)$
847 : $P_{28885} = (20, 5, 27, 1)$
848 : $P_{28889} = (24, 5, 27, 1)$
849 : $P_{29049} = (24, 10, 27, 1)$
850 : $P_{29051} = (26, 10, 27, 1)$
851 : $P_{29134} = (13, 13, 27, 1)$
852 : $P_{29146} = (25, 13, 27, 1)$
853 : $P_{29220} = (3, 16, 27, 1)$
854 : $P_{29236} = (19, 16, 27, 1)$
855 : $P_{29289} = (8, 18, 27, 1)$
856 : $P_{29298} = (17, 18, 27, 1)$
857 : $P_{29330} = (17, 19, 27, 1)$
858 : $P_{29336} = (23, 19, 27, 1)$
859 : $P_{29371} = (26, 20, 27, 1)$
860 : $P_{29376} = (31, 20, 27, 1)$
861 : $P_{29421} = (12, 22, 27, 1)$
862 : $P_{29440} = (31, 22, 27, 1)$
863 : $P_{29493} = (20, 24, 27, 1)$
864 : $P_{29503} = (30, 24, 27, 1)$
865 : $P_{29509} = (4, 25, 27, 1)$
866 : $P_{29526} = (21, 25, 27, 1)$
867 : $P_{29558} = (21, 26, 27, 1)$
868 : $P_{29573} = (4, 27, 27, 1)$
869 : $P_{29602} = (1, 28, 27, 1)$
870 : $P_{29626} = (25, 28, 27, 1)$
871 : $P_{29700} = (3, 31, 27, 1)$
872 : $P_{29742} = (13, 0, 28, 1)$
873 : $P_{29847} = (22, 3, 28, 1)$
874 : $P_{29895} = (6, 5, 28, 1)$
875 : $P_{29902} = (13, 5, 28, 1)$
876 : $P_{29929} = (8, 6, 28, 1)$
877 : $P_{29947} = (26, 6, 28, 1)$
878 : $P_{30088} = (7, 11, 28, 1)$
879 : $P_{30092} = (11, 11, 28, 1)$
880 : $P_{30213} = (4, 15, 28, 1)$
881 : $P_{30230} = (21, 15, 28, 1)$
882 : $P_{30249} = (8, 16, 28, 1)$
883 : $P_{30272} = (31, 16, 28, 1)$
884 : $P_{30284} = (11, 17, 28, 1)$
885 : $P_{30288} = (15, 17, 28, 1)$
886 : $P_{30440} = (7, 22, 28, 1)$
887 : $P_{30452} = (19, 22, 28, 1)$
888 : $P_{30541} = (12, 25, 28, 1)$
889 : $P_{30555} = (26, 25, 28, 1)$
890 : $P_{30567} = (6, 26, 28, 1)$
891 : $P_{30576} = (15, 26, 28, 1)$
892 : $P_{30614} = (21, 27, 28, 1)$
893 : $P_{30615} = (22, 27, 28, 1)$
894 : $P_{30656} = (31, 28, 28, 1)$
895 : $P_{30676} = (19, 29, 28, 1)$
896 : $P_{30693} = (4, 30, 28, 1)$
897 : $P_{30701} = (12, 30, 28, 1)$
898 : $P_{30760} = (7, 0, 29, 1)$
899 : $P_{30800} = (15, 1, 29, 1)$
900 : $P_{30804} = (19, 1, 29, 1)$
901 : $P_{30818} = (1, 2, 29, 1)$
902 : $P_{30831} = (14, 2, 29, 1)$
903 : $P_{30931} = (18, 5, 29, 1)$
904 : $P_{30937} = (24, 5, 29, 1)$
905 : $P_{30990} = (13, 7, 29, 1)$
906 : $P_{31005} = (28, 7, 29, 1)$
907 : $P_{31027} = (18, 8, 29, 1)$

908 : $P_{31034} = (25, 8, 29, 1)$
909 : $P_{31076} = (3, 10, 29, 1)$
910 : $P_{31080} = (7, 10, 29, 1)$
911 : $P_{31126} = (21, 11, 29, 1)$
912 : $P_{31129} = (24, 11, 29, 1)$
913 : $P_{31152} = (15, 12, 29, 1)$
914 : $P_{31158} = (21, 12, 29, 1)$
915 : $P_{31178} = (9, 13, 29, 1)$
916 : $P_{31196} = (27, 13, 29, 1)$
917 : $P_{31214} = (13, 14, 29, 1)$
918 : $P_{31223} = (22, 14, 29, 1)$
919 : $P_{31266} = (1, 16, 29, 1)$
920 : $P_{31288} = (23, 16, 29, 1)$
921 : $P_{31384} = (23, 19, 29, 1)$
922 : $P_{31418} = (25, 20, 29, 1)$
923 : $P_{31419} = (26, 20, 29, 1)$
924 : $P_{31452} = (27, 21, 29, 1)$
925 : $P_{31453} = (28, 21, 29, 1)$
926 : $P_{31462} = (5, 22, 29, 1)$
927 : $P_{31473} = (16, 22, 29, 1)$
928 : $P_{31526} = (5, 24, 29, 1)$
929 : $P_{31530} = (9, 24, 29, 1)$
930 : $P_{31652} = (3, 28, 29, 1)$
931 : $P_{31695} = (14, 29, 29, 1)$
932 : $P_{31732} = (19, 30, 29, 1)$
933 : $P_{31739} = (26, 30, 29, 1)$
934 : $P_{31761} = (16, 31, 29, 1)$
935 : $P_{31767} = (22, 31, 29, 1)$
936 : $P_{31794} = (17, 0, 30, 1)$
937 : $P_{31889} = (16, 3, 30, 1)$
938 : $P_{31891} = (18, 3, 30, 1)$
939 : $P_{31916} = (11, 4, 30, 1)$
940 : $P_{31933} = (28, 4, 30, 1)$
941 : $P_{31975} = (6, 6, 30, 1)$
942 : $P_{31991} = (22, 6, 30, 1)$
943 : $P_{32066} = (1, 9, 30, 1)$
944 : $P_{32092} = (27, 9, 30, 1)$
945 : $P_{32170} = (9, 12, 30, 1)$
946 : $P_{32177} = (16, 12, 30, 1)$
947 : $P_{32202} = (9, 13, 30, 1)$
948 : $P_{32217} = (24, 13, 30, 1)$
949 : $P_{32363} = (10, 18, 30, 1)$
950 : $P_{32375} = (22, 18, 30, 1)$
951 : $P_{32435} = (18, 20, 30, 1)$
952 : $P_{32495} = (14, 22, 30, 1)$
953 : $P_{32505} = (24, 22, 30, 1)$
954 : $P_{32591} = (14, 25, 30, 1)$
955 : $P_{32603} = (26, 25, 30, 1)$
956 : $P_{32626} = (17, 26, 30, 1)$
957 : $P_{32635} = (26, 26, 30, 1)$
958 : $P_{32674} = (1, 28, 30, 1)$
959 : $P_{32701} = (28, 28, 30, 1)$
960 : $P_{32711} = (6, 29, 30, 1)$
961 : $P_{32716} = (11, 29, 30, 1)$
962 : $P_{32747} = (10, 30, 30, 1)$
963 : $P_{32796} = (27, 31, 30, 1)$
964 : $P_{32830} = (29, 0, 31, 1)$
965 : $P_{32836} = (3, 1, 31, 1)$
966 : $P_{32862} = (29, 1, 31, 1)$
967 : $P_{33147} = (26, 10, 31, 1)$
968 : $P_{33149} = (28, 10, 31, 1)$
969 : $P_{33231} = (14, 13, 31, 1)$
970 : $P_{33247} = (30, 13, 31, 1)$
971 : $P_{33259} = (10, 14, 31, 1)$
972 : $P_{33268} = (19, 14, 31, 1)$
973 : $P_{33286} = (5, 15, 31, 1)$
974 : $P_{33304} = (23, 15, 31, 1)$
975 : $P_{33372} = (27, 17, 31, 1)$
976 : $P_{33373} = (28, 17, 31, 1)$
977 : $P_{33387} = (10, 18, 31, 1)$
978 : $P_{33400} = (23, 18, 31, 1)$
979 : $P_{33541} = (4, 23, 31, 1)$
980 : $P_{33567} = (30, 23, 31, 1)$
981 : $P_{33589} = (20, 24, 31, 1)$
982 : $P_{33595} = (26, 24, 31, 1)$
983 : $P_{33615} = (14, 25, 31, 1)$
984 : $P_{33628} = (27, 25, 31, 1)$
985 : $P_{33636} = (3, 26, 31, 1)$
986 : $P_{33642} = (9, 26, 31, 1)$
987 : $P_{33684} = (19, 27, 31, 1)$
988 : $P_{33734} = (5, 29, 31, 1)$
989 : $P_{33738} = (9, 29, 31, 1)$
990 : $P_{33781} = (20, 30, 31, 1)$
991 : $P_{33797} = (4, 31, 31, 1)$

Line Intersection Graph

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

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2
in point	P_3	P_{1090}

Line 1 intersects

Line	ℓ_0
in point	P_3

Line 2 intersects

Line	ℓ_0
in point	P_{1090}

The surface has 1089 points:
Too many to print.