Rank-74500 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

$$X_0^3 + X_1^2X_2 + X_1^2X_3 + X_0X_3^2 + X_0X_1X_2 = 0$$

(1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is 1108378662

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:

$0: \ P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$
$1: \ P_{1059} = \mathbf{P}(1,0,0,1) = \mathbf{P}(1,0,0,1)$

The 3 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{1082369} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{1082369} = \mathbf{Pl}(0,0,0,1,0,1)_{36865}$$

$$\ell_1 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1083424} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1083424} = \mathbf{Pl}(0,1,0,0,0,0)_1$$

$$\ell_2 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{34848} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{34848} = \mathbf{Pl}(0,1,1,0,0,0)_{34}$$

Rank of lines: (1082369, 1083424, 34848)
Rank of points on Klein quadric: (36865, 1, 34)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

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

$P_{2082} = (0,0,1,1) = \ell_0 \cap \ell_1$
$P_2 = (0,0,1,0) = \ell_1 \cap \ell_2$

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 : $P_3 = (0,0,0,1)$ lies on line ℓ_1
2 : $P_{1059} = (1,0,0,1)$ lies on line ℓ_2
3 : $P_{2083} = (1,0,1,1)$ lies on line ℓ_2
4 : $P_{2114} = (0,1,1,1)$ lies on line ℓ_0
5 : $P_{2145} = (0,2,1,1)$ lies on line ℓ_0
6 : $P_{2177} = (0,3,1,1)$ lies on line ℓ_0
7 : $P_{2209} = (0,4,1,1)$ lies on line ℓ_0
8 : $P_{2241} = (0,5,1,1)$ lies on line ℓ_0
9 : $P_{2273} = (0,6,1,1)$ lies on line ℓ_0
10 : $P_{2305} = (0,7,1,1)$ lies on line ℓ_0
11 : $P_{2337} = (0,8,1,1)$ lies on line ℓ_0
12 : $P_{2369} = (0,9,1,1)$ lies on line ℓ_0
13 : $P_{2401} = (0,10,1,1)$ lies on line ℓ_0
14 : $P_{2433} = (0,11,1,1)$ lies on line ℓ_0
15 : $P_{2465} = (0,12,1,1)$ lies on line ℓ_0
16 : $P_{2497} = (0,13,1,1)$ lies on line ℓ_0
17 : $P_{2529} = (0,14,1,1)$ lies on line ℓ_0
18 : $P_{2561} = (0,15,1,1)$ lies on line ℓ_0
19 : $P_{2593} = (0,16,1,1)$ lies on line ℓ_0
20 : $P_{2625} = (0,17,1,1)$ lies on line ℓ_0
21 : $P_{2657} = (0,18,1,1)$ lies on line ℓ_0
22 : $P_{2689} = (0,19,1,1)$ lies on line ℓ_0
23 : $P_{2721} = (0,20,1,1)$ lies on line ℓ_0
24 : $P_{2753} = (0,21,1,1)$ lies on line ℓ_0
25 : $P_{2785} = (0,22,1,1)$ lies on line ℓ_0
26 : $P_{2817} = (0,23,1,1)$ lies on line ℓ_0
27 : $P_{2849} = (0,24,1,1)$ lies on line ℓ_0
28 : $P_{2881} = (0,25,1,1)$ lies on line ℓ_0
29 : $P_{2913} = (0,26,1,1)$ lies on line ℓ_0
30 : $P_{2945} = (0,27,1,1)$ lies on line ℓ_0
31 : $P_{2977} = (0,28,1,1)$ lies on line ℓ_0
32 : $P_{3009} = (0,29,1,1)$ lies on line ℓ_0
33 : $P_{3041} = (0,30,1,1)$ lies on line ℓ_0
34 : $P_{3073} = (0,31,1,1)$ lies on line ℓ_0
35 : $P_{3105} = (0,0,2,1)$ lies on line ℓ_1
36 : $P_{3106} = (1,0,2,1)$ lies on line ℓ_2
37 : $P_{4129} = (0,0,3,1)$ lies on line ℓ_1
38 : $P_{4130} = (1,0,3,1)$ lies on line ℓ_2
39 : $P_{5153} = (0,0,4,1)$ lies on line ℓ_1
40 : $P_{5154} = (1,0,4,1)$ lies on line ℓ_2
41 : $P_{6177} = (0,0,5,1)$ lies on line ℓ_1
42 : $P_{6178} = (1,0,5,1)$ lies on line ℓ_2
43 : $P_{7201} = (0,0,6,1)$ lies on line ℓ_1
44 : $P_{7202} = (1,0,6,1)$ lies on line ℓ_2
45 : $P_{8225} = (0,0,7,1)$ lies on line ℓ_1
46 : $P_{8226} = (1,0,7,1)$ lies on line ℓ_2
47 : $P_{9249} = (0,0,8,1)$ lies on line ℓ_1
48 : $P_{9250} = (1,0,8,1)$ lies on line ℓ_2
49 : $P_{10273} = (0,0,9,1)$ lies on line ℓ_1
50 : $P_{10274} = (1,0,9,1)$ lies on line ℓ_2
51 : $P_{11297} = (0,0,10,1)$ lies on line ℓ_1

52 : $P_{11298} = (1, 0, 10, 1)$ lies on line ℓ_2
53 : $P_{12321} = (0, 0, 11, 1)$ lies on line ℓ_1
54 : $P_{12322} = (1, 0, 11, 1)$ lies on line ℓ_2
55 : $P_{13345} = (0, 0, 12, 1)$ lies on line ℓ_1
56 : $P_{13346} = (1, 0, 12, 1)$ lies on line ℓ_2
57 : $P_{14369} = (0, 0, 13, 1)$ lies on line ℓ_1
58 : $P_{14370} = (1, 0, 13, 1)$ lies on line ℓ_2
59 : $P_{15393} = (0, 0, 14, 1)$ lies on line ℓ_1
60 : $P_{15394} = (1, 0, 14, 1)$ lies on line ℓ_2
61 : $P_{16417} = (0, 0, 15, 1)$ lies on line ℓ_1
62 : $P_{16418} = (1, 0, 15, 1)$ lies on line ℓ_2
63 : $P_{17441} = (0, 0, 16, 1)$ lies on line ℓ_1
64 : $P_{17442} = (1, 0, 16, 1)$ lies on line ℓ_2
65 : $P_{18465} = (0, 0, 17, 1)$ lies on line ℓ_1
66 : $P_{18466} = (1, 0, 17, 1)$ lies on line ℓ_2
67 : $P_{19489} = (0, 0, 18, 1)$ lies on line ℓ_1
68 : $P_{19490} = (1, 0, 18, 1)$ lies on line ℓ_2
69 : $P_{20513} = (0, 0, 19, 1)$ lies on line ℓ_1
70 : $P_{20514} = (1, 0, 19, 1)$ lies on line ℓ_2
71 : $P_{21537} = (0, 0, 20, 1)$ lies on line ℓ_1
72 : $P_{21538} = (1, 0, 20, 1)$ lies on line ℓ_2
73 : $P_{22561} = (0, 0, 21, 1)$ lies on line ℓ_1
74 : $P_{22562} = (1, 0, 21, 1)$ lies on line ℓ_2
75 : $P_{23585} = (0, 0, 22, 1)$ lies on line ℓ_1
76 : $P_{23586} = (1, 0, 22, 1)$ lies on line ℓ_2
77 : $P_{24609} = (0, 0, 23, 1)$ lies on line ℓ_1
78 : $P_{24610} = (1, 0, 23, 1)$ lies on line ℓ_2
79 : $P_{25633} = (0, 0, 24, 1)$ lies on line ℓ_1
80 : $P_{25634} = (1, 0, 24, 1)$ lies on line ℓ_2
81 : $P_{26657} = (0, 0, 25, 1)$ lies on line ℓ_1
82 : $P_{26658} = (1, 0, 25, 1)$ lies on line ℓ_2
83 : $P_{27681} = (0, 0, 26, 1)$ lies on line ℓ_1
84 : $P_{27682} = (1, 0, 26, 1)$ lies on line ℓ_2
85 : $P_{28705} = (0, 0, 27, 1)$ lies on line ℓ_1
86 : $P_{28706} = (1, 0, 27, 1)$ lies on line ℓ_2
87 : $P_{29729} = (0, 0, 28, 1)$ lies on line ℓ_1
88 : $P_{29730} = (1, 0, 28, 1)$ lies on line ℓ_2
89 : $P_{30753} = (0, 0, 29, 1)$ lies on line ℓ_1
90 : $P_{30754} = (1, 0, 29, 1)$ lies on line ℓ_2
91 : $P_{31777} = (0, 0, 30, 1)$ lies on line ℓ_1
92 : $P_{31778} = (1, 0, 30, 1)$ lies on line ℓ_2
93 : $P_{32801} = (0, 0, 31, 1)$ lies on line ℓ_1
94 : $P_{32802} = (1, 0, 31, 1)$ lies on line ℓ_2

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 : $P_{112} = (13, 2, 1, 0)$
1 : $P_{146} = (15, 3, 1, 0)$
2 : $P_{149} = (18, 3, 1, 0)$
3 : $P_{160} = (29, 3, 1, 0)$
4 : $P_{190} = (27, 4, 1, 0)$
5 : $P_{204} = (9, 5, 1, 0)$
6 : $P_{217} = (22, 5, 1, 0)$
7 : $P_{226} = (31, 5, 1, 0)$
8 : $P_{316} = (25, 8, 1, 0)$
9 : $P_{327} = (4, 9, 1, 0)$
10 : $P_{361} = (6, 10, 1, 0)$
11 : $P_{403} = (16, 11, 1, 0)$
12 : $P_{425} = (6, 12, 1, 0)$
13 : $P_{428} = (9, 12, 1, 0)$
14 : $P_{434} = (15, 12, 1, 0)$
15 : $P_{455} = (4, 13, 1, 0)$
16 : $P_{503} = (20, 14, 1, 0)$
17 : $P_{528} = (13, 15, 1, 0)$
18 : $P_{549} = (2, 16, 1, 0)$
19 : $P_{590} = (11, 17, 1, 0)$
20 : $P_{597} = (18, 17, 1, 0)$
21 : $P_{604} = (25, 17, 1, 0)$
22 : $P_{613} = (2, 18, 1, 0)$
23 : $P_{665} = (22, 19, 1, 0)$
24 : $P_{878} = (11, 26, 1, 0)$
25 : $P_{887} = (20, 26, 1, 0)$
26 : $P_{898} = (31, 26, 1, 0)$
27 : $P_{915} = (16, 27, 1, 0)$
28 : $P_{1024} = (29, 30, 1, 0)$
29 : $P_{1054} = (27, 31, 1, 0)$
30 : $P_{1140} = (18, 2, 0, 1)$
31 : $P_{1166} = (12, 3, 0, 1)$
32 : $P_{1175} = (21, 3, 0, 1)$
33 : $P_{1179} = (25, 3, 0, 1)$
34 : $P_{1195} = (9, 4, 0, 1)$
35 : $P_{1224} = (6, 5, 0, 1)$
36 : $P_{1244} = (26, 5, 0, 1)$
37 : $P_{1246} = (28, 5, 0, 1)$
38 : $P_{1316} = (2, 8, 0, 1)$
39 : $P_{1360} = (14, 9, 0, 1)$
40 : $P_{1382} = (4, 10, 0, 1)$
41 : $P_{1440} = (30, 11, 0, 1)$
42 : $P_{1447} = (5, 12, 0, 1)$
43 : $P_{1466} = (24, 12, 0, 1)$

$44: P_{1471} = (29, 12, 0, 1)$
$45: P_{1489} = (15, 13, 0, 1)$
$46: P_{1522} = (16, 14, 0, 1)$
$47: P_{1557} = (19, 15, 0, 1)$
$48: P_{1581} = (11, 16, 0, 1)$
$49: P_{1605} = (3, 17, 0, 1)$
$50: P_{1622} = (20, 17, 0, 1)$
$51: P_{1625} = (23, 17, 0, 1)$
$52: P_{1644} = (10, 18, 0, 1)$
$53: P_{1693} = (27, 19, 0, 1)$
$54: P_{1897} = (7, 26, 0, 1)$
$55: P_{1907} = (17, 26, 0, 1)$
$56: P_{1912} = (22, 26, 0, 1)$
$57: P_{1953} = (31, 27, 0, 1)$
$58: P_{2031} = (13, 30, 0, 1)$
$59: P_{2058} = (8, 31, 0, 1)$
$60: P_{2171} = (26, 2, 1, 1)$
$61: P_{2204} = (27, 3, 1, 1)$
$62: P_{2212} = (3, 4, 1, 1)$
$63: P_{2243} = (2, 5, 1, 1)$
$64: P_{2297} = (24, 6, 1, 1)$
$65: P_{2330} = (25, 7, 1, 1)$
$66: P_{2355} = (18, 8, 1, 1)$
$67: P_{2388} = (19, 9, 1, 1)$
$68: P_{2410} = (9, 10, 1, 1)$
$69: P_{2441} = (8, 11, 1, 1)$
$70: P_{2481} = (16, 12, 1, 1)$
$71: P_{2514} = (17, 13, 1, 1)$
$72: P_{2540} = (11, 14, 1, 1)$
$73: P_{2571} = (10, 15, 1, 1)$
$74: P_{2598} = (5, 16, 1, 1)$
$75: P_{2629} = (4, 17, 1, 1)$
$76: P_{2687} = (30, 18, 1, 1)$
$77: P_{2720} = (31, 19, 1, 1)$
$78: P_{2728} = (7, 20, 1, 1)$
$79: P_{2759} = (6, 21, 1, 1)$
$80: P_{2813} = (28, 22, 1, 1)$
$81: P_{2846} = (29, 23, 1, 1)$
$82: P_{2871} = (22, 24, 1, 1)$
$83: P_{2904} = (23, 25, 1, 1)$
$84: P_{2926} = (13, 26, 1, 1)$
$85: P_{2957} = (12, 27, 1, 1)$
$86: P_{2997} = (20, 28, 1, 1)$
$87: P_{3030} = (21, 29, 1, 1)$
$88: P_{3056} = (15, 30, 1, 1)$
$89: P_{3087} = (14, 31, 1, 1)$
$90: P_{3294} = (29, 5, 2, 1)$
$91: P_{3367} = (6, 8, 2, 1)$
$92: P_{3378} = (17, 8, 2, 1)$
$93: P_{3384} = (23, 8, 2, 1)$
$94: P_{3414} = (21, 9, 2, 1)$
$95: P_{3471} = (14, 11, 2, 1)$
$96: P_{3495} = (6, 12, 2, 1)$
$97: P_{3508} = (19, 12, 2, 1)$
$98: P_{3510} = (21, 12, 2, 1)$
$99: P_{3532} = (11, 13, 2, 1)$
$100: P_{3540} = (19, 13, 2, 1)$
$101: P_{3545} = (24, 13, 2, 1)$
$102: P_{3642} = (25, 16, 2, 1)$
$103: P_{3704} = (23, 18, 2, 1)$
$104: P_{3742} = (29, 19, 2, 1)$
$105: P_{3771} = (26, 20, 2, 1)$
$106: P_{3826} = (17, 22, 2, 1)$
$107: P_{3851} = (10, 23, 2, 1)$
$108: P_{3889} = (16, 24, 2, 1)$
$109: P_{3942} = (5, 26, 2, 1)$
$110: P_{3979} = (10, 27, 2, 1)$
$111: P_{3985} = (16, 27, 2, 1)$
$112: P_{3995} = (26, 27, 2, 1)$
$113: P_{4006} = (5, 28, 2, 1)$
$114: P_{4012} = (11, 28, 2, 1)$
$115: P_{4015} = (14, 28, 2, 1)$
$116: P_{4034} = (1, 29, 2, 1)$
$117: P_{4057} = (24, 29, 2, 1)$
$118: P_{4058} = (25, 29, 2, 1)$
$119: P_{4165} = (4, 1, 3, 1)$
$120: P_{4205} = (12, 2, 3, 1)$
$121: P_{4244} = (19, 3, 3, 1)$
$122: P_{4270} = (13, 4, 3, 1)$
$123: P_{4306} = (17, 5, 3, 1)$
$124: P_{4357} = (4, 7, 3, 1)$
$125: P_{4397} = (12, 8, 3, 1)$
$126: P_{4432} = (15, 9, 3, 1)$
$127: P_{4479} = (30, 10, 3, 1)$
$128: P_{4490} = (9, 11, 3, 1)$
$129: P_{4500} = (19, 11, 3, 1)$
$130: P_{4507} = (26, 11, 3, 1)$
$131: P_{4533} = (20, 12, 3, 1)$
$132: P_{4576} = (31, 13, 3, 1)$
$133: P_{4594} = (17, 14, 3, 1)$
$134: P_{4616} = (7, 15, 3, 1)$
$135: P_{4633} = (24, 15, 3, 1)$
$136: P_{4640} = (31, 15, 3, 1)$
$137: P_{4725} = (20, 18, 3, 1)$
$138: P_{4738} = (1, 19, 3, 1)$
$139: P_{4751} = (14, 19, 3, 1)$
$140: P_{4752} = (15, 19, 3, 1)$
$141: P_{4778} = (9, 20, 3, 1)$
$142: P_{4886} = (21, 23, 3, 1)$
$143: P_{4936} = (7, 25, 3, 1)$
$144: P_{4975} = (14, 26, 3, 1)$
$145: P_{4982} = (21, 26, 3, 1)$
$146: P_{4988} = (27, 26, 3, 1)$
$147: P_{4999} = (6, 27, 3, 1)$
$148: P_{5017} = (24, 27, 3, 1)$
$149: P_{5023} = (30, 27, 3, 1)$
$150: P_{5051} = (26, 28, 3, 1)$
$151: P_{5070} = (13, 29, 3, 1)$

$152: P_{5095} = (6, 30, 3, 1)$
$153: P_{5116} = (27, 30, 3, 1)$
$154: P_{5118} = (29, 30, 3, 1)$
$155: P_{5150} = (29, 31, 3, 1)$
$156: P_{5220} = (3, 2, 4, 1)$
$157: P_{5230} = (13, 2, 4, 1)$
$158: P_{5231} = (14, 2, 4, 1)$
$159: P_{5266} = (17, 3, 4, 1)$
$160: P_{5390} = (13, 7, 4, 1)$
$161: P_{5431} = (22, 8, 4, 1)$
$162: P_{5465} = (24, 9, 4, 1)$
$163: P_{5485} = (12, 10, 4, 1)$
$164: P_{5493} = (20, 10, 4, 1)$
$165: P_{5497} = (24, 10, 4, 1)$
$166: P_{5533} = (28, 11, 4, 1)$
$167: P_{5575} = (6, 13, 4, 1)$
$168: P_{5663} = (30, 15, 4, 1)$
$169: P_{5719} = (22, 17, 4, 1)$
$170: P_{5858} = (1, 22, 4, 1)$
$171: P_{5863} = (6, 22, 4, 1)$
$172: P_{5864} = (7, 22, 4, 1)$
$173: P_{5904} = (15, 23, 4, 1)$
$174: P_{5906} = (17, 23, 4, 1)$
$175: P_{5919} = (30, 23, 4, 1)$
$176: P_{5935} = (14, 24, 4, 1)$
$177: P_{5965} = (12, 25, 4, 1)$
$178: P_{5993} = (8, 26, 4, 1)$
$179: P_{6005} = (20, 26, 4, 1)$
$180: P_{6013} = (28, 26, 4, 1)$
$181: P_{6024} = (7, 27, 4, 1)$
$182: P_{6025} = (8, 27, 4, 1)$
$183: P_{6032} = (15, 27, 4, 1)$
$184: P_{6084} = (3, 29, 4, 1)$
$185: P_{6225} = (16, 1, 5, 1)$
$186: P_{6248} = (7, 2, 5, 1)$
$187: P_{6260} = (19, 2, 5, 1)$
$188: P_{6261} = (20, 2, 5, 1)$
$189: P_{6275} = (2, 3, 5, 1)$
$190: P_{6301} = (28, 3, 5, 1)$
$191: P_{6303} = (30, 3, 5, 1)$
$192: P_{6331} = (26, 4, 5, 1)$
$193: P_{6345} = (8, 5, 5, 1)$
$194: P_{6390} = (21, 6, 5, 1)$
$195: P_{6434} = (1, 8, 5, 1)$
$196: P_{6463} = (30, 8, 5, 1)$
$197: P_{6464} = (31, 8, 5, 1)$
$198: P_{6494} = (29, 9, 5, 1)$
$199: P_{6523} = (26, 10, 5, 1)$
$200: P_{6560} = (31, 11, 5, 1)$
$201: P_{6644} = (19, 14, 5, 1)$
$202: P_{6660} = (3, 15, 5, 1)$
$203: P_{6665} = (8, 15, 5, 1)$
$204: P_{6668} = (11, 15, 5, 1)$
$205: P_{6716} = (27, 16, 5, 1)$
$206: P_{6733} = (12, 17, 5, 1)$
$207: P_{6775} = (22, 18, 5, 1)$
$208: P_{6787} = (2, 19, 5, 1)$
$209: P_{6805} = (20, 19, 5, 1)$
$210: P_{6807} = (22, 19, 5, 1)$
$211: P_{6865} = (16, 21, 5, 1)$
$212: P_{6908} = (27, 22, 5, 1)$
$213: P_{6916} = (3, 23, 5, 1)$
$214: P_{6973} = (28, 24, 5, 1)$
$215: P_{7038} = (29, 26, 5, 1)$
$216: P_{7059} = (18, 27, 5, 1)$
$217: P_{7116} = (11, 29, 5, 1)$
$218: P_{7149} = (12, 30, 5, 1)$
$219: P_{7176} = (7, 31, 5, 1)$
$220: P_{7187} = (18, 31, 5, 1)$
$221: P_{7190} = (21, 31, 5, 1)$
$222: P_{7241} = (8, 1, 6, 1)$
$223: P_{7251} = (18, 1, 6, 1)$
$224: P_{7259} = (26, 1, 6, 1)$
$225: P_{7271} = (6, 2, 6, 1)$
$226: P_{7331} = (2, 4, 6, 1)$
$227: P_{7401} = (8, 6, 6, 1)$
$228: P_{7444} = (19, 7, 6, 1)$
$229: P_{7495} = (6, 9, 6, 1)$
$230: P_{7556} = (3, 11, 6, 1)$
$231: P_{7618} = (1, 13, 6, 1)$
$232: P_{7645} = (28, 13, 6, 1)$
$233: P_{7646} = (29, 13, 6, 1)$
$234: P_{7670} = (21, 14, 6, 1)$
$235: P_{7737} = (24, 16, 6, 1)$
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642 : $P_{21759} = (30, 6, 20, 1)$
643 : $P_{21783} = (22, 7, 20, 1)$
644 : $P_{21828} = (3, 9, 20, 1)$
645 : $P_{21909} = (20, 11, 20, 1)$
646 : $P_{21960} = (7, 13, 20, 1)$
647 : $P_{22022} = (5, 15, 20, 1)$
648 : $P_{22053} = (4, 16, 20, 1)$
649 : $P_{22149} = (4, 19, 20, 1)$
650 : $P_{22153} = (8, 19, 20, 1)$
651 : $P_{22157} = (12, 19, 20, 1)$
652 : $P_{22187} = (10, 20, 20, 1)$
653 : $P_{22217} = (8, 21, 20, 1)$
654 : $P_{22253} = (12, 22, 20, 1)$
655 : $P_{22278} = (5, 23, 20, 1)$
656 : $P_{22298} = (25, 23, 20, 1)$
657 : $P_{22301} = (28, 23, 20, 1)$
658 : $P_{22402} = (1, 27, 20, 1)$
659 : $P_{22423} = (22, 27, 20, 1)$
660 : $P_{22424} = (23, 27, 20, 1)$
661 : $P_{22442} = (9, 28, 20, 1)$
662 : $P_{22456} = (23, 28, 20, 1)$
663 : $P_{22463} = (30, 28, 20, 1)$
664 : $P_{22525} = (28, 30, 20, 1)$
665 : $P_{22617} = (24, 1, 21, 1)$
666 : $P_{22713} = (24, 4, 21, 1)$
667 : $P_{22739} = (18, 5, 21, 1)$
668 : $P_{22762} = (9, 6, 21, 1)$
669 : $P_{22791} = (6, 7, 21, 1)$
670 : $P_{22962} = (17, 12, 21, 1)$
671 : $P_{23040} = (31, 14, 21, 1)$
672 : $P_{23043} = (2, 15, 21, 1)$
673 : $P_{23045} = (4, 15, 21, 1)$
674 : $P_{23047} = (6, 15, 21, 1)$
675 : $P_{23087} = (14, 16, 21, 1)$
676 : $P_{23203} = (2, 20, 21, 1)$
677 : $P_{23250} = (17, 21, 21, 1)$
678 : $P_{23347} = (18, 24, 21, 1)$
679 : $P_{23402} = (9, 26, 21, 1)$
680 : $P_{23439} = (14, 27, 21, 1)$
681 : $P_{23461} = (4, 28, 21, 1)$
682 : $P_{23484} = (27, 28, 21, 1)$
683 : $P_{23488} = (31, 28, 21, 1)$
684 : $P_{23516} = (27, 29, 21, 1)$
685 : $P_{23554} = (1, 31, 21, 1)$
686 : $P_{23632} = (15, 1, 22, 1)$
687 : $P_{23634} = (17, 1, 22, 1)$
688 : $P_{23647} = (30, 1, 22, 1)$
689 : $P_{23677} = (28, 2, 22, 1)$
690 : $P_{23714} = (1, 4, 22, 1)$
691 : $P_{23719} = (6, 4, 22, 1)$

692 : $P_{23720} = (7, 4, 22, 1)$
693 : $P_{23780} = (3, 6, 22, 1)$
694 : $P_{23821} = (12, 7, 22, 1)$
695 : $P_{23829} = (20, 7, 22, 1)$
696 : $P_{23833} = (24, 7, 22, 1)$
697 : $P_{23865} = (24, 8, 22, 1)$
698 : $P_{23908} = (3, 10, 22, 1)$
699 : $P_{23918} = (13, 10, 22, 1)$
700 : $P_{23919} = (14, 10, 22, 1)$
701 : $P_{24023} = (22, 13, 22, 1)$
702 : $P_{24082} = (17, 15, 22, 1)$
703 : $P_{24173} = (12, 18, 22, 1)$
704 : $P_{24319} = (30, 22, 22, 1)$
705 : $P_{24335} = (14, 23, 22, 1)$
706 : $P_{24360} = (7, 24, 22, 1)$
707 : $P_{24361} = (8, 24, 22, 1)$
708 : $P_{24368} = (15, 24, 22, 1)$
709 : $P_{24462} = (13, 27, 22, 1)$
710 : $P_{24487} = (6, 28, 22, 1)$
711 : $P_{24521} = (8, 29, 22, 1)$
712 : $P_{24533} = (20, 29, 22, 1)$
713 : $P_{24541} = (28, 29, 22, 1)$
714 : $P_{24599} = (22, 31, 22, 1)$
715 : $P_{24662} = (21, 1, 23, 1)$
716 : $P_{24731} = (26, 3, 23, 1)$
717 : $P_{24756} = (19, 4, 23, 1)$
718 : $P_{24784} = (15, 5, 23, 1)$
719 : $P_{24898} = (1, 9, 23, 1)$
720 : $P_{25004} = (11, 12, 23, 1)$
721 : $P_{25046} = (21, 13, 23, 1)$
722 : $P_{25198} = (13, 18, 23, 1)$
723 : $P_{25201} = (16, 18, 23, 1)$
724 : $P_{25214} = (29, 18, 23, 1)$
725 : $P_{25226} = (9, 19, 23, 1)$
726 : $P_{25292} = (11, 21, 23, 1)$
727 : $P_{25329} = (16, 22, 23, 1)$
728 : $P_{25371} = (26, 23, 23, 1)$
729 : $P_{25381} = (4, 24, 23, 1)$
730 : $P_{25386} = (9, 24, 23, 1)$
731 : $P_{25390} = (13, 24, 23, 1)$
732 : $P_{25413} = (4, 25, 23, 1)$
733 : $P_{25492} = (19, 27, 23, 1)$
734 : $P_{25534} = (29, 28, 23, 1)$
735 : $P_{25552} = (15, 29, 23, 1)$
736 : $P_{25693} = (28, 1, 24, 1)$
737 : $P_{25705} = (8, 2, 24, 1)$
738 : $P_{25796} = (3, 5, 24, 1)$
739 : $P_{25841} = (16, 6, 24, 1)$
740 : $P_{25868} = (11, 7, 24, 1)$
741 : $P_{25873} = (16, 7, 24, 1)$
742 : $P_{25884} = (27, 7, 24, 1)$
743 : $P_{25900} = (11, 8, 24, 1)$
744 : $P_{25934} = (13, 9, 24, 1)$
745 : $P_{25943} = (22, 9, 24, 1)$
746 : $P_{25948} = (27, 9, 24, 1)$
747 : $P_{25986} = (1, 11, 24, 1)$
748 : $P_{26153} = (8, 16, 24, 1)$
749 : $P_{26208} = (31, 17, 24, 1)$
750 : $P_{26368} = (31, 22, 24, 1)$
751 : $P_{26391} = (22, 23, 24, 1)$
752 : $P_{26404} = (3, 24, 24, 1)$
753 : $P_{26446} = (13, 25, 24, 1)$
754 : $P_{26480} = (15, 26, 24, 1)$
755 : $P_{26525} = (28, 27, 24, 1)$
756 : $P_{26544} = (15, 28, 24, 1)$
757 : $P_{26701} = (12, 1, 25, 1)$
758 : $P_{26708} = (19, 1, 25, 1)$
759 : $P_{26720} = (31, 1, 25, 1)$
760 : $P_{26748} = (27, 2, 25, 1)$
761 : $P_{26808} = (23, 4, 25, 1)$
762 : $P_{26891} = (10, 7, 25, 1)$
763 : $P_{26902} = (21, 7, 25, 1)$
764 : $P_{26912} = (31, 7, 25, 1)$
765 : $P_{26971} = (26, 9, 25, 1)$
766 : $P_{26984} = (7, 10, 25, 1)$
767 : $P_{27110} = (5, 14, 25, 1)$
768 : $P_{27132} = (27, 14, 25, 1)$
769 : $P_{27135} = (30, 14, 25, 1)$
770 : $P_{27170} = (1, 16, 25, 1)$
771 : $P_{27189} = (20, 16, 25, 1)$
772 : $P_{27190} = (21, 16, 25, 1)$
773 : $P_{27258} = (25, 18, 25, 1)$
774 : $P_{27302} = (5, 20, 25, 1)$
775 : $P_{27336} = (7, 21, 25, 1)$
776 : $P_{27355} = (26, 21, 25, 1)$
777 : $P_{27358} = (29, 21, 25, 1)$
778 : $P_{27371} = (10, 22, 25, 1)$
779 : $P_{27384} = (23, 22, 25, 1)$
780 : $P_{27390} = (29, 22, 25, 1)$
781 : $P_{27413} = (20, 23, 25, 1)$
782 : $P_{27455} = (30, 24, 25, 1)$
783 : $P_{27476} = (19, 25, 25, 1)$
784 : $P_{27546} = (25, 27, 25, 1)$
785 : $P_{27661} = (12, 31, 25, 1)$
786 : $P_{27715} = (2, 1, 26, 1)$
787 : $P_{27761} = (16, 2, 26, 1)$
788 : $P_{27782} = (5, 3, 26, 1)$
789 : $P_{27891} = (18, 6, 26, 1)$
790 : $P_{27951} = (14, 8, 26, 1)$
791 : $P_{27981} = (12, 9, 26, 1)$
792 : $P_{27987} = (18, 9, 26, 1)$
793 : $P_{27999} = (30, 9, 26, 1)$
794 : $P_{28006} = (5, 10, 26, 1)$
795 : $P_{28048} = (15, 11, 26, 1)$
796 : $P_{28056} = (23, 11, 26, 1)$
797 : $P_{28057} = (24, 11, 26, 1)$
798 : $P_{28072} = (7, 12, 26, 1)$
799 : $P_{28075} = (10, 12, 26, 1)$

800 : $P_{28078} = (13, 12, 26, 1)$
801 : $P_{28111} = (14, 13, 26, 1)$
802 : $P_{28120} = (23, 13, 26, 1)$
803 : $P_{28122} = (25, 13, 26, 1)$
804 : $P_{28142} = (13, 14, 26, 1)$
805 : $P_{28149} = (20, 14, 26, 1)$
806 : $P_{28154} = (25, 14, 26, 1)$
807 : $P_{28181} = (20, 15, 26, 1)$
808 : $P_{28208} = (15, 16, 26, 1)$
809 : $P_{28231} = (6, 17, 26, 1)$
810 : $P_{28268} = (11, 18, 26, 1)$
811 : $P_{28306} = (17, 19, 26, 1)$
812 : $P_{28337} = (16, 20, 26, 1)$
813 : $P_{28365} = (12, 21, 26, 1)$
814 : $P_{28409} = (24, 22, 26, 1)$
815 : $P_{28451} = (2, 24, 26, 1)$
816 : $P_{28543} = (30, 26, 26, 1)$
817 : $P_{28562} = (17, 27, 26, 1)$
818 : $P_{28584} = (7, 28, 26, 1)$
819 : $P_{28642} = (1, 30, 26, 1)$
820 : $P_{28651} = (10, 30, 26, 1)$
821 : $P_{28652} = (11, 30, 26, 1)$
822 : $P_{28679} = (6, 31, 26, 1)$
823 : $P_{28821} = (20, 3, 27, 1)$
824 : $P_{28855} = (22, 4, 27, 1)$
825 : $P_{28909} = (12, 6, 27, 1)$
826 : $P_{29003} = (10, 9, 27, 1)$
827 : $P_{29092} = (3, 12, 27, 1)$
828 : $P_{29125} = (4, 13, 27, 1)$
829 : $P_{29129} = (8, 13, 27, 1)$
830 : $P_{29133} = (12, 13, 27, 1)$
831 : $P_{29226} = (9, 16, 27, 1)$
832 : $P_{29240} = (23, 16, 27, 1)$
833 : $P_{29247} = (30, 16, 27, 1)$
834 : $P_{29256} = (7, 17, 27, 1)$
835 : $P_{29274} = (25, 17, 27, 1)$
836 : $P_{29279} = (30, 17, 27, 1)$
837 : $P_{29288} = (7, 18, 27, 1)$
838 : $P_{29318} = (5, 19, 27, 1)$
839 : $P_{29338} = (25, 19, 27, 1)$
840 : $P_{29341} = (28, 19, 27, 1)$
841 : $P_{29346} = (1, 20, 27, 1)$
842 : $P_{29367} = (22, 20, 27, 1)$
843 : $P_{29368} = (23, 20, 27, 1)$
844 : $P_{29380} = (3, 21, 27, 1)$
845 : $P_{29386} = (9, 21, 27, 1)$
846 : $P_{29387} = (10, 21, 27, 1)$
847 : $P_{29445} = (4, 23, 27, 1)$
848 : $P_{29609} = (8, 28, 27, 1)$
849 : $P_{29638} = (5, 29, 27, 1)$
850 : $P_{29685} = (20, 30, 27, 1)$
851 : $P_{29725} = (28, 31, 27, 1)$
852 : $P_{29768} = (7, 1, 28, 1)$
853 : $P_{29823} = (30, 2, 28, 1)$
854 : $P_{29836} = (11, 3, 28, 1)$
855 : $P_{29962} = (9, 7, 28, 1)$
856 : $P_{30175} = (30, 13, 28, 1)$
857 : $P_{30248} = (7, 16, 28, 1)$
858 : $P_{30282} = (9, 17, 28, 1)$
859 : $P_{30306} = (1, 18, 28, 1)$
860 : $P_{30380} = (11, 20, 28, 1)$
861 : $P_{30421} = (20, 21, 28, 1)$
862 : $P_{30435} = (2, 22, 28, 1)$
863 : $P_{30467} = (2, 23, 28, 1)$
864 : $P_{30481} = (16, 23, 28, 1)$
865 : $P_{30483} = (18, 23, 28, 1)$
866 : $P_{30573} = (12, 26, 28, 1)$
867 : $P_{30637} = (12, 28, 28, 1)$
868 : $P_{30661} = (4, 29, 28, 1)$
869 : $P_{30707} = (18, 30, 28, 1)$
870 : $P_{30725} = (4, 31, 28, 1)$
871 : $P_{30737} = (16, 31, 28, 1)$
872 : $P_{30741} = (20, 31, 28, 1)$
873 : $P_{30790} = (5, 1, 29, 1)$
874 : $P_{30796} = (11, 1, 29, 1)$
875 : $P_{30799} = (14, 1, 29, 1)$
876 : $P_{30818} = (1, 2, 29, 1)$
877 : $P_{30841} = (24, 2, 29, 1)$
878 : $P_{30842} = (25, 2, 29, 1)$
879 : $P_{31019} = (10, 8, 29, 1)$
880 : $P_{31025} = (16, 8, 29, 1)$
881 : $P_{31035} = (26, 8, 29, 1)$
882 : $P_{31110} = (5, 11, 29, 1)$
883 : $P_{31185} = (16, 13, 29, 1)$
884 : $P_{31262} = (29, 15, 29, 1)$
885 : $P_{31294} = (29, 16, 29, 1)$
886 : $P_{31384} = (23, 19, 29, 1)$
887 : $P_{31399} = (6, 20, 29, 1)$
888 : $P_{31412} = (19, 20, 29, 1)$
889 : $P_{31414} = (21, 20, 29, 1)$
890 : $P_{31450} = (25, 21, 29, 1)$
891 : $P_{31500} = (11, 23, 29, 1)$
892 : $P_{31508} = (19, 23, 29, 1)$
893 : $P_{31513} = (24, 23, 29, 1)$
894 : $P_{31527} = (6, 24, 29, 1)$
895 : $P_{31538} = (17, 24, 29, 1)$
896 : $P_{31544} = (23, 24, 29, 1)$
897 : $P_{31579} = (26, 25, 29, 1)$
898 : $P_{31638} = (21, 27, 29, 1)$
899 : $P_{31659} = (10, 28, 29, 1)$
900 : $P_{31695} = (14, 29, 29, 1)$
901 : $P_{31762} = (17, 31, 29, 1)$
902 : $P_{31815} = (6, 1, 30, 1)$
903 : $P_{31858} = (17, 2, 30, 1)$
904 : $P_{31922} = (17, 4, 30, 1)$
905 : $P_{31944} = (7, 5, 30, 1)$
906 : $P_{31947} = (10, 5, 30, 1)$
907 : $P_{31950} = (13, 5, 30, 1)$

908 : $P_{31983} = (14, 6, 30, 1)$
909 : $P_{32038} = (5, 8, 30, 1)$
910 : $P_{32072} = (7, 9, 30, 1)$
911 : $P_{32099} = (2, 10, 30, 1)$
912 : $P_{32176} = (15, 12, 30, 1)$
913 : $P_{32213} = (20, 13, 30, 1)$
914 : $P_{32240} = (15, 14, 30, 1)$
915 : $P_{32248} = (23, 14, 30, 1)$
916 : $P_{32249} = (24, 14, 30, 1)$
917 : $P_{32273} = (16, 15, 30, 1)$
918 : $P_{32307} = (18, 16, 30, 1)$
919 : $P_{32401} = (16, 19, 30, 1)$
920 : $P_{32429} = (12, 20, 30, 1)$
921 : $P_{32454} = (5, 21, 30, 1)$
922 : $P_{32494} = (13, 22, 30, 1)$
923 : $P_{32501} = (20, 22, 30, 1)$
924 : $P_{32506} = (25, 22, 30, 1)$
925 : $P_{32519} = (6, 23, 30, 1)$
926 : $P_{32607} = (30, 25, 30, 1)$
927 : $P_{32610} = (1, 26, 30, 1)$
928 : $P_{32619} = (10, 26, 30, 1)$
929 : $P_{32620} = (11, 26, 30, 1)$
930 : $P_{32643} = (2, 27, 30, 1)$
931 : $P_{32697} = (24, 28, 30, 1)$
932 : $P_{32717} = (12, 29, 30, 1)$
933 : $P_{32723} = (18, 29, 30, 1)$
934 : $P_{32735} = (30, 29, 30, 1)$
935 : $P_{32751} = (14, 30, 30, 1)$
936 : $P_{32760} = (23, 30, 30, 1)$
937 : $P_{32762} = (25, 30, 30, 1)$
938 : $P_{32780} = (11, 31, 30, 1)$
939 : $P_{32903} = (6, 3, 31, 1)$
940 : $P_{33024} = (31, 6, 31, 1)$
941 : $P_{33039} = (14, 7, 31, 1)$
942 : $P_{33106} = (17, 9, 31, 1)$
943 : $P_{33170} = (17, 11, 31, 1)$
944 : $P_{33189} = (4, 12, 31, 1)$
945 : $P_{33212} = (27, 12, 31, 1)$
946 : $P_{33216} = (31, 12, 31, 1)$
947 : $P_{33267} = (18, 14, 31, 1)$
948 : $P_{33295} = (14, 15, 31, 1)$
949 : $P_{33379} = (2, 18, 31, 1)$
950 : $P_{33381} = (4, 18, 31, 1)$
951 : $P_{33383} = (6, 18, 31, 1)$
952 : $P_{33465} = (24, 20, 31, 1)$
953 : $P_{33474} = (1, 21, 31, 1)$
954 : $P_{33523} = (18, 22, 31, 1)$
955 : $P_{33546} = (9, 23, 31, 1)$
956 : $P_{33596} = (27, 24, 31, 1)$
957 : $P_{33657} = (24, 26, 31, 1)$
958 : $P_{33674} = (9, 27, 31, 1)$
959 : $P_{33731} = (2, 29, 31, 1)$

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_{2082}

Line 1 intersects

Line	ℓ_0	ℓ_2
in point	P_{2082}	P_2

Line 2 intersects

Line	ℓ_1
in point	P_2

The surface has 1057 points:
Too many to print.