Rank-65903 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 1, 1, 0, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is -2079258587

General information

Number of lines	4
Number of points	1121
Number of singular points	0
Number of Eckardt points	0
Number of double points	4
Number of single points	124
Number of points off lines	993
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33^4
Type of lines on points	2^4, 1^{124}, 0^{993}

Singular Points

The surface has 0 singular points:

The 4 Lines

The lines and their Pluecker coordinates are:

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

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{1025} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{1025} = \mathbf{Pl}(0,0,1,0,1,0)_{1152}$$

$$\ell_2 = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{array}\right]_{33824} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{array}\right]_{33824} = \mathbf{Pl}(1,0,0,1,0,0)_{66}$$

$$\ell_3 = \left[\begin{array}{cccc} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{2082} = \left[\begin{array}{cccc} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{2082} = \mathbf{Pl}(0,0,1,1,1,1)_{70562}$$

Rank of lines: (0, 1025, 33824, 2082)
Rank of points on Klein quadric: (0, 1152, 66, 70562)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 4 Double points:
The double points on the surface are:

$P_0 = (1,0,0,0) = \ell_0 \cap \ell_1$
$P_1 = (0,1,0,0) = \ell_0 \cap \ell_2$
$P_5 = (1,1,0,0) = \ell_0 \cap \ell_3$
$P_{2082} = (0,0,1,1) = \ell_1 \cap \ell_3$

Single Points

The surface has 124 single points:
The single points on the surface are:

0 : $P_4 = (1,1,1,1)$ lies on line ℓ_3
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 : $P_{1059} = (1,0,0,1)$ lies on line ℓ_2
32 : $P_{1091} = (1,1,0,1)$ lies on line ℓ_2
33 : $P_{1123} = (1,2,0,1)$ lies on line ℓ_2
34 : $P_{1155} = (1,3,0,1)$ lies on line ℓ_2
35 : $P_{1187} = (1,4,0,1)$ lies on line ℓ_2
36 : $P_{1219} = (1,5,0,1)$ lies on line ℓ_2
37 : $P_{1251} = (1,6,0,1)$ lies on line ℓ_2
38 : $P_{1283} = (1,7,0,1)$ lies on line ℓ_2
39 : $P_{1315} = (1,8,0,1)$ lies on line ℓ_2
40 : $P_{1347} = (1,9,0,1)$ lies on line ℓ_2
41 : $P_{1379} = (1,10,0,1)$ lies on line ℓ_2
42 : $P_{1411} = (1,11,0,1)$ lies on line ℓ_2
43 : $P_{1443} = (1,12,0,1)$ lies on line ℓ_2
44 : $P_{1475} = (1,13,0,1)$ lies on line ℓ_2
45 : $P_{1507} = (1,14,0,1)$ lies on line ℓ_2
46 : $P_{1539} = (1,15,0,1)$ lies on line ℓ_2
47 : $P_{1571} = (1,16,0,1)$ lies on line ℓ_2
48 : $P_{1603} = (1,17,0,1)$ lies on line ℓ_2
49 : $P_{1635} = (1,18,0,1)$ lies on line ℓ_2

50 : $P_{1667} = (1, 19, 0, 1)$ lies on line ℓ_2
51 : $P_{1699} = (1, 20, 0, 1)$ lies on line ℓ_2
52 : $P_{1731} = (1, 21, 0, 1)$ lies on line ℓ_2
53 : $P_{1763} = (1, 22, 0, 1)$ lies on line ℓ_2
54 : $P_{1795} = (1, 23, 0, 1)$ lies on line ℓ_2
55 : $P_{1827} = (1, 24, 0, 1)$ lies on line ℓ_2
56 : $P_{1859} = (1, 25, 0, 1)$ lies on line ℓ_2
57 : $P_{1891} = (1, 26, 0, 1)$ lies on line ℓ_2
58 : $P_{1923} = (1, 27, 0, 1)$ lies on line ℓ_2
59 : $P_{1955} = (1, 28, 0, 1)$ lies on line ℓ_2
60 : $P_{1987} = (1, 29, 0, 1)$ lies on line ℓ_2
61 : $P_{2019} = (1, 30, 0, 1)$ lies on line ℓ_2
62 : $P_{2051} = (1, 31, 0, 1)$ lies on line ℓ_2
63 : $P_{2083} = (1, 0, 1, 1)$ lies on line ℓ_1
64 : $P_{2084} = (2, 0, 1, 1)$ lies on line ℓ_1
65 : $P_{2085} = (3, 0, 1, 1)$ lies on line ℓ_1
66 : $P_{2086} = (4, 0, 1, 1)$ lies on line ℓ_1
67 : $P_{2087} = (5, 0, 1, 1)$ lies on line ℓ_1
68 : $P_{2088} = (6, 0, 1, 1)$ lies on line ℓ_1
69 : $P_{2089} = (7, 0, 1, 1)$ lies on line ℓ_1
70 : $P_{2090} = (8, 0, 1, 1)$ lies on line ℓ_1
71 : $P_{2091} = (9, 0, 1, 1)$ lies on line ℓ_1
72 : $P_{2092} = (10, 0, 1, 1)$ lies on line ℓ_1
73 : $P_{2093} = (11, 0, 1, 1)$ lies on line ℓ_1
74 : $P_{2094} = (12, 0, 1, 1)$ lies on line ℓ_1
75 : $P_{2095} = (13, 0, 1, 1)$ lies on line ℓ_1
76 : $P_{2096} = (14, 0, 1, 1)$ lies on line ℓ_1
77 : $P_{2097} = (15, 0, 1, 1)$ lies on line ℓ_1
78 : $P_{2098} = (16, 0, 1, 1)$ lies on line ℓ_1
79 : $P_{2099} = (17, 0, 1, 1)$ lies on line ℓ_1
80 : $P_{2100} = (18, 0, 1, 1)$ lies on line ℓ_1
81 : $P_{2101} = (19, 0, 1, 1)$ lies on line ℓ_1
82 : $P_{2102} = (20, 0, 1, 1)$ lies on line ℓ_1
83 : $P_{2103} = (21, 0, 1, 1)$ lies on line ℓ_1
84 : $P_{2104} = (22, 0, 1, 1)$ lies on line ℓ_1
85 : $P_{2105} = (23, 0, 1, 1)$ lies on line ℓ_1
86 : $P_{2106} = (24, 0, 1, 1)$ lies on line ℓ_1
87 : $P_{2107} = (25, 0, 1, 1)$ lies on line ℓ_1
88 : $P_{2108} = (26, 0, 1, 1)$ lies on line ℓ_1
89 : $P_{2109} = (27, 0, 1, 1)$ lies on line ℓ_1
90 : $P_{2110} = (28, 0, 1, 1)$ lies on line ℓ_1
91 : $P_{2111} = (29, 0, 1, 1)$ lies on line ℓ_1
92 : $P_{2112} = (30, 0, 1, 1)$ lies on line ℓ_1
93 : $P_{2113} = (31, 0, 1, 1)$ lies on line ℓ_1
94 : $P_{2147} = (2, 2, 1, 1)$ lies on line ℓ_3
95 : $P_{2180} = (3, 3, 1, 1)$ lies on line ℓ_3
96 : $P_{2213} = (4, 4, 1, 1)$ lies on line ℓ_3
97 : $P_{2246} = (5, 5, 1, 1)$ lies on line ℓ_3
98 : $P_{2279} = (6, 6, 1, 1)$ lies on line ℓ_3
99 : $P_{2312} = (7, 7, 1, 1)$ lies on line ℓ_3
100 : $P_{2345} = (8, 8, 1, 1)$ lies on line ℓ_3
101 : $P_{2378} = (9, 9, 1, 1)$ lies on line ℓ_3
102 : $P_{2411} = (10, 10, 1, 1)$ lies on line ℓ_3
103 : $P_{2444} = (11, 11, 1, 1)$ lies on line ℓ_3
104 : $P_{2477} = (12, 12, 1, 1)$ lies on line ℓ_3
105 : $P_{2510} = (13, 13, 1, 1)$ lies on line ℓ_3
106 : $P_{2543} = (14, 14, 1, 1)$ lies on line ℓ_3
107 : $P_{2576} = (15, 15, 1, 1)$ lies on line ℓ_3
108 : $P_{2609} = (16, 16, 1, 1)$ lies on line ℓ_3
109 : $P_{2642} = (17, 17, 1, 1)$ lies on line ℓ_3
110 : $P_{2675} = (18, 18, 1, 1)$ lies on line ℓ_3
111 : $P_{2708} = (19, 19, 1, 1)$ lies on line ℓ_3
112 : $P_{2741} = (20, 20, 1, 1)$ lies on line ℓ_3
113 : $P_{2774} = (21, 21, 1, 1)$ lies on line ℓ_3
114 : $P_{2807} = (22, 22, 1, 1)$ lies on line ℓ_3
115 : $P_{2840} = (23, 23, 1, 1)$ lies on line ℓ_3
116 : $P_{2873} = (24, 24, 1, 1)$ lies on line ℓ_3
117 : $P_{2906} = (25, 25, 1, 1)$ lies on line ℓ_3
118 : $P_{2939} = (26, 26, 1, 1)$ lies on line ℓ_3
119 : $P_{2972} = (27, 27, 1, 1)$ lies on line ℓ_3
120 : $P_{3005} = (28, 28, 1, 1)$ lies on line ℓ_3
121 : $P_{3038} = (29, 29, 1, 1)$ lies on line ℓ_3
122 : $P_{3071} = (30, 30, 1, 1)$ lies on line ℓ_3
123 : $P_{3104} = (31, 31, 1, 1)$ lies on line ℓ_3

The single points on the surface are:

Points on surface but on no line

The surface has 993 points not on any line:
The points on the surface but not on lines are:

0 : $P_{36} = (1, 0, 1, 0)$
1 : $P_{67} = (0, 1, 1, 0)$
2 : $P_{68} = (1, 1, 1, 0)$
3 : $P_{151} = (20, 3, 1, 0)$
4 : $P_{154} = (23, 3, 1, 0)$
5 : $P_{219} = (24, 5, 1, 0)$
6 : $P_{224} = (29, 5, 1, 0)$
7 : $P_{253} = (26, 6, 1, 0)$
8 : $P_{255} = (28, 6, 1, 0)$
9 : $P_{276} = (17, 7, 1, 0)$
10 : $P_{281} = (22, 7, 1, 0)$
11 : $P_{440} = (21, 12, 1, 0)$

$12: P_{444} = (25, 12, 1, 0)$
$13: P_{586} = (7, 17, 1, 0)$
$14: P_{601} = (22, 17, 1, 0)$
$15: P_{678} = (3, 20, 1, 0)$
$16: P_{698} = (23, 20, 1, 0)$
$17: P_{719} = (12, 21, 1, 0)$
$18: P_{732} = (25, 21, 1, 0)$
$19: P_{746} = (7, 22, 1, 0)$
$20: P_{756} = (17, 22, 1, 0)$
$21: P_{774} = (3, 23, 1, 0)$
$22: P_{791} = (20, 23, 1, 0)$
$23: P_{808} = (5, 24, 1, 0)$
$24: P_{832} = (29, 24, 1, 0)$
$25: P_{847} = (12, 25, 1, 0)$
$26: P_{856} = (21, 25, 1, 0)$
$27: P_{873} = (6, 26, 1, 0)$
$28: P_{895} = (28, 26, 1, 0)$
$29: P_{937} = (6, 28, 1, 0)$
$30: P_{957} = (26, 28, 1, 0)$
$31: P_{968} = (5, 29, 1, 0)$
$32: P_{987} = (24, 29, 1, 0)$
$33: P_{3129} = (24, 0, 2, 1)$
$34: P_{3175} = (6, 2, 2, 1)$
$35: P_{3194} = (25, 2, 2, 1)$
$36: P_{3214} = (13, 3, 2, 1)$
$37: P_{3216} = (15, 3, 2, 1)$
$38: P_{3239} = (6, 4, 2, 1)$
$39: P_{3262} = (29, 4, 2, 1)$
$40: P_{3409} = (16, 9, 2, 1)$
$41: P_{3423} = (30, 9, 2, 1)$
$42: P_{3464} = (7, 11, 2, 1)$
$43: P_{3479} = (22, 11, 2, 1)$
$44: P_{3496} = (7, 12, 2, 1)$
$45: P_{3504} = (15, 12, 2, 1)$
$46: P_{3566} = (13, 14, 2, 1)$
$47: P_{3579} = (26, 14, 2, 1)$
$48: P_{3625} = (8, 16, 2, 1)$
$49: P_{3628} = (11, 16, 2, 1)$
$50: P_{3717} = (4, 19, 2, 1)$
$51: P_{3718} = (5, 19, 2, 1)$
$52: P_{3747} = (2, 20, 2, 1)$
$53: P_{3771} = (26, 20, 2, 1)$
$54: P_{3811} = (2, 22, 2, 1)$
$55: P_{3814} = (5, 22, 2, 1)$
$56: P_{3845} = (4, 23, 2, 1)$
$57: P_{3871} = (30, 23, 2, 1)$
$58: P_{3881} = (8, 24, 2, 1)$
$59: P_{3897} = (24, 24, 2, 1)$
$60: P_{3921} = (16, 25, 2, 1)$
$61: P_{3934} = (29, 25, 2, 1)$
$62: P_{3980} = (11, 27, 2, 1)$
$63: P_{3994} = (25, 27, 2, 1)$
$64: P_{4033} = (0, 29, 2, 1)$
$65: P_{4055} = (22, 29, 2, 1)$
$66: P_{4153} = (24, 0, 3, 1)$
$67: P_{4170} = (9, 1, 3, 1)$
$68: P_{4187} = (26, 1, 3, 1)$
$69: P_{4265} = (8, 4, 3, 1)$
$70: P_{4271} = (14, 4, 3, 1)$
$71: P_{4300} = (11, 5, 3, 1)$
$72: P_{4319} = (30, 5, 3, 1)$
$73: P_{4339} = (18, 6, 3, 1)$
$74: P_{4344} = (23, 6, 3, 1)$
$75: P_{4390} = (5, 8, 3, 1)$
$76: P_{4394} = (9, 8, 3, 1)$
$77: P_{4450} = (1, 10, 3, 1)$
$78: P_{4463} = (14, 10, 3, 1)$
$79: P_{4482} = (1, 11, 3, 1)$
$80: P_{4510} = (29, 11, 3, 1)$
$81: P_{4515} = (2, 12, 3, 1)$
$82: P_{4521} = (8, 12, 3, 1)$
$83: P_{4550} = (5, 13, 3, 1)$
$84: P_{4573} = (28, 13, 3, 1)$
$85: P_{4579} = (2, 14, 3, 1)$
$86: P_{4588} = (11, 14, 3, 1)$
$87: P_{4696} = (23, 17, 3, 1)$
$88: P_{4701} = (28, 17, 3, 1)$
$89: P_{4781} = (12, 20, 3, 1)$
$90: P_{4787} = (18, 20, 3, 1)$
$91: P_{4833} = (0, 22, 3, 1)$
$92: P_{4862} = (29, 22, 3, 1)$
$93: P_{4909} = (12, 24, 3, 1)$
$94: P_{4921} = (24, 24, 3, 1)$
$95: P_{5019} = (26, 27, 3, 1)$
$96: P_{5023} = (30, 27, 3, 1)$
$97: P_{5160} = (7, 0, 4, 1)$
$98: P_{5223} = (6, 2, 4, 1)$
$99: P_{5232} = (15, 2, 4, 1)$
$100: P_{5287} = (6, 4, 4, 1)$
$101: P_{5301} = (20, 4, 4, 1)$
$102: P_{5340} = (27, 5, 4, 1)$
$103: P_{5344} = (31, 5, 4, 1)$
$104: P_{5358} = (13, 6, 4, 1)$
$105: P_{5367} = (22, 6, 4, 1)$
$106: P_{5384} = (7, 7, 4, 1)$
$107: P_{5387} = (10, 7, 4, 1)$
$108: P_{5425} = (16, 8, 4, 1)$
$109: P_{5426} = (17, 8, 4, 1)$
$110: P_{5518} = (13, 11, 4, 1)$
$111: P_{5524} = (19, 11, 4, 1)$
$112: P_{5579} = (10, 13, 4, 1)$
$113: P_{5584} = (15, 13, 4, 1)$
$114: P_{5654} = (21, 15, 4, 1)$
$115: P_{5658} = (25, 15, 4, 1)$
$116: P_{5685} = (20, 16, 4, 1)$
$117: P_{5687} = (22, 16, 4, 1)$
$118: P_{5857} = (0, 22, 4, 1)$
$119: P_{5882} = (25, 22, 4, 1)$

$120: P_{5937} = (16, 24, 4, 1)$
$121: P_{5940} = (19, 24, 4, 1)$
$122: P_{5957} = (4, 25, 4, 1)$
$123: P_{5970} = (17, 25, 4, 1)$
$124: P_{6006} = (21, 26, 4, 1)$
$125: P_{6016} = (31, 26, 4, 1)$
$126: P_{6084} = (3, 29, 4, 1)$
$127: P_{6085} = (4, 29, 4, 1)$
$128: P_{6116} = (3, 30, 4, 1)$
$129: P_{6140} = (27, 30, 4, 1)$
$130: P_{6184} = (7, 0, 5, 1)$
$131: P_{6212} = (3, 1, 5, 1)$
$132: P_{6220} = (11, 1, 5, 1)$
$133: P_{6244} = (3, 2, 5, 1)$
$134: P_{6260} = (19, 2, 5, 1)$
$135: P_{6408} = (7, 7, 5, 1)$
$136: P_{6427} = (26, 7, 5, 1)$
$137: P_{6508} = (11, 10, 5, 1)$
$138: P_{6514} = (17, 10, 5, 1)$
$139: P_{6584} = (23, 12, 5, 1)$
$140: P_{6585} = (24, 12, 5, 1)$
$141: P_{6626} = (1, 14, 5, 1)$
$142: P_{6655} = (30, 14, 5, 1)$
$143: P_{6658} = (1, 15, 5, 1)$
$144: P_{6679} = (22, 15, 5, 1)$
$145: P_{6699} = (10, 16, 5, 1)$
$146: P_{6719} = (30, 16, 5, 1)$
$147: P_{6736} = (15, 17, 5, 1)$
$148: P_{6740} = (19, 17, 5, 1)$
$149: P_{6826} = (9, 20, 5, 1)$
$150: P_{6841} = (24, 20, 5, 1)$
$151: P_{6977} = (0, 25, 5, 1)$
$152: P_{6999} = (22, 25, 5, 1)$
$153: P_{7013} = (4, 26, 5, 1)$
$154: P_{7019} = (10, 26, 5, 1)$
$155: P_{7058} = (17, 27, 5, 1)$
$156: P_{7064} = (23, 27, 5, 1)$
$157: P_{7114} = (9, 29, 5, 1)$
$158: P_{7131} = (26, 29, 5, 1)$
$159: P_{7141} = (4, 30, 5, 1)$
$160: P_{7152} = (15, 30, 5, 1)$
$161: P_{7231} = (30, 0, 6, 1)$
$162: P_{7235} = (2, 1, 6, 1)$
$163: P_{7248} = (15, 1, 6, 1)$
$164: P_{7271} = (6, 2, 6, 1)$
$165: P_{7293} = (28, 2, 6, 1)$
$166: P_{7299} = (2, 3, 6, 1)$
$167: P_{7318} = (21, 3, 6, 1)$
$168: P_{7335} = (6, 4, 6, 1)$
$169: P_{7352} = (23, 4, 6, 1)$
$170: P_{7409} = (16, 6, 6, 1)$
$171: P_{7420} = (27, 6, 6, 1)$
$172: P_{7585} = (0, 12, 6, 1)$
$173: P_{7607} = (22, 12, 6, 1)$
$174: P_{7620} = (3, 13, 6, 1)$
$175: P_{7641} = (24, 13, 6, 1)$
$176: P_{7652} = (3, 14, 6, 1)$
$177: P_{7664} = (15, 14, 6, 1)$
$178: P_{7823} = (14, 19, 6, 1)$
$179: P_{7832} = (23, 19, 6, 1)$
$180: P_{7883} = (10, 21, 6, 1)$
$181: P_{7897} = (24, 21, 6, 1)$
$182: P_{7921} = (16, 22, 6, 1)$
$183: P_{7926} = (21, 22, 6, 1)$
$184: P_{8038} = (5, 26, 6, 1)$
$185: P_{8055} = (22, 26, 6, 1)$
$186: P_{8143} = (14, 29, 6, 1)$
$187: P_{8156} = (27, 29, 6, 1)$
$188: P_{8189} = (28, 30, 6, 1)$
$189: P_{8191} = (30, 30, 6, 1)$
$190: P_{8198} = (5, 31, 6, 1)$
$191: P_{8203} = (10, 31, 6, 1)$
$192: P_{8255} = (30, 0, 7, 1)$
$193: P_{8275} = (18, 1, 7, 1)$
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601 : $P_{21230} = (13, 22, 19, 1)$
602 : $P_{21235} = (18, 22, 19, 1)$
603 : $P_{21288} = (7, 24, 19, 1)$
604 : $P_{21291} = (10, 24, 19, 1)$
605 : $P_{21366} = (21, 26, 19, 1)$
606 : $P_{21375} = (30, 26, 19, 1)$
607 : $P_{21382} = (5, 27, 19, 1)$
608 : $P_{21390} = (13, 27, 19, 1)$
609 : $P_{21411} = (2, 28, 19, 1)$
610 : $P_{21412} = (3, 28, 19, 1)$
611 : $P_{21475} = (2, 30, 19, 1)$
612 : $P_{21478} = (5, 30, 19, 1)$
613 : $P_{21508} = (3, 31, 19, 1)$
614 : $P_{21512} = (7, 31, 19, 1)$
615 : $P_{21556} = (19, 0, 20, 1)$
616 : $P_{21573} = (4, 1, 20, 1)$
617 : $P_{21600} = (31, 1, 20, 1)$
618 : $P_{21650} = (17, 3, 20, 1)$
619 : $P_{21658} = (25, 3, 20, 1)$
620 : $P_{21685} = (20, 4, 20, 1)$
621 : $P_{21688} = (23, 4, 20, 1)$
622 : $P_{21701} = (4, 5, 20, 1)$
623 : $P_{21725} = (28, 5, 20, 1)$
624 : $P_{21817} = (24, 8, 20, 1)$
625 : $P_{21823} = (30, 8, 20, 1)$
626 : $P_{22069} = (20, 16, 20, 1)$
627 : $P_{22073} = (24, 16, 20, 1)$
628 : $P_{22127} = (14, 18, 20, 1)$
629 : $P_{22130} = (17, 18, 20, 1)$
630 : $P_{22164} = (19, 19, 20, 1)$
631 : $P_{22168} = (23, 19, 20, 1)$
632 : $P_{22179} = (2, 20, 20, 1)$
633 : $P_{22190} = (13, 20, 20, 1)$
634 : $P_{22243} = (2, 22, 20, 1)$
635 : $P_{22271} = (30, 22, 20, 1)$
636 : $P_{22350} = (13, 25, 20, 1)$
637 : $P_{22365} = (28, 25, 20, 1)$
638 : $P_{22369} = (0, 26, 20, 1)$
639 : $P_{22394} = (25, 26, 20, 1)$
640 : $P_{22406} = (5, 27, 20, 1)$
641 : $P_{22408} = (7, 27, 20, 1)$
642 : $P_{22440} = (7, 28, 20, 1)$
643 : $P_{22447} = (14, 28, 20, 1)$
644 : $P_{22502} = (5, 30, 20, 1)$
645 : $P_{22528} = (31, 30, 20, 1)$
646 : $P_{22580} = (19, 0, 21, 1)$
647 : $P_{22602} = (9, 1, 21, 1)$
648 : $P_{22615} = (22, 1, 21, 1)$
649 : $P_{22635} = (10, 2, 21, 1)$
650 : $P_{22642} = (17, 2, 21, 1)$
651 : $P_{22683} = (26, 3, 21, 1)$
652 : $P_{22687} = (30, 3, 21, 1)$
653 : $P_{22724} = (3, 5, 21, 1)$
654 : $P_{22736} = (15, 5, 21, 1)$
655 : $P_{22756} = (3, 6, 21, 1)$
656 : $P_{22764} = (11, 6, 21, 1)$
657 : $P_{22826} = (9, 8, 21, 1)$
658 : $P_{22827} = (10, 8, 21, 1)$
659 : $P_{22853} = (4, 9, 21, 1)$

660 : $P_{22873} = (24, 9, 21, 1)$
661 : $P_{22896} = (15, 10, 21, 1)$
662 : $P_{22904} = (23, 10, 21, 1)$
663 : $P_{22981} = (4, 13, 21, 1)$
664 : $P_{22988} = (11, 13, 21, 1)$
665 : $P_{23074} = (1, 16, 21, 1)$
666 : $P_{23080} = (7, 16, 21, 1)$
667 : $P_{23106} = (1, 17, 21, 1)$
668 : $P_{23129} = (24, 17, 21, 1)$
669 : $P_{23186} = (17, 19, 21, 1)$
670 : $P_{23188} = (19, 19, 21, 1)$
671 : $P_{23304} = (7, 23, 21, 1)$
672 : $P_{23319} = (22, 23, 21, 1)$
673 : $P_{23361} = (0, 25, 21, 1)$
674 : $P_{23387} = (26, 25, 21, 1)$
675 : $P_{23512} = (23, 29, 21, 1)$
676 : $P_{23519} = (30, 29, 21, 1)$
677 : $P_{23595} = (10, 0, 22, 1)$
678 : $P_{23626} = (9, 1, 22, 1)$
679 : $P_{23630} = (13, 1, 22, 1)$
680 : $P_{23725} = (12, 4, 22, 1)$
681 : $P_{23741} = (28, 4, 22, 1)$
682 : $P_{23745} = (0, 5, 22, 1)$
683 : $P_{23765} = (20, 5, 22, 1)$
684 : $P_{23785} = (8, 6, 22, 1)$
685 : $P_{23793} = (16, 6, 22, 1)$
686 : $P_{23850} = (9, 8, 22, 1)$
687 : $P_{23853} = (12, 8, 22, 1)$
688 : $P_{23912} = (7, 10, 22, 1)$
689 : $P_{23915} = (10, 10, 22, 1)$
690 : $P_{23956} = (19, 11, 22, 1)$
691 : $P_{23963} = (26, 11, 22, 1)$
692 : $P_{23982} = (13, 12, 22, 1)$
693 : $P_{23993} = (24, 12, 22, 1)$
694 : $P_{24008} = (7, 13, 22, 1)$
695 : $P_{24023} = (22, 13, 22, 1)$
696 : $P_{24041} = (8, 14, 22, 1)$
697 : $P_{24054} = (21, 14, 22, 1)$
698 : $P_{24149} = (20, 17, 22, 1)$
699 : $P_{24155} = (26, 17, 22, 1)$
700 : $P_{24227} = (2, 20, 22, 1)$
701 : $P_{24249} = (24, 20, 22, 1)$
702 : $P_{24291} = (2, 22, 22, 1)$
703 : $P_{24305} = (16, 22, 22, 1)$
704 : $P_{24372} = (19, 24, 22, 1)$
705 : $P_{24381} = (28, 24, 22, 1)$
706 : $P_{24470} = (21, 27, 22, 1)$
707 : $P_{24471} = (22, 27, 22, 1)$
708 : $P_{24619} = (10, 0, 23, 1)$
709 : $P_{24647} = (6, 1, 23, 1)$
710 : $P_{24656} = (15, 1, 23, 1)$
711 : $P_{24686} = (13, 2, 23, 1)$
712 : $P_{24704} = (31, 2, 23, 1)$
713 : $P_{24839} = (6, 7, 23, 1)$
714 : $P_{24861} = (28, 7, 23, 1)$
715 : $P_{24939} = (10, 10, 23, 1)$
716 : $P_{24955} = (26, 10, 23, 1)$
717 : $P_{25010} = (17, 12, 23, 1)$
718 : $P_{25011} = (18, 12, 23, 1)$
719 : $P_{25072} = (15, 14, 23, 1)$
720 : $P_{25087} = (30, 14, 23, 1)$
721 : $P_{25102} = (13, 15, 23, 1)$
722 : $P_{25110} = (21, 15, 23, 1)$
723 : $P_{25147} = (26, 16, 23, 1)$
724 : $P_{25151} = (30, 16, 23, 1)$
725 : $P_{25158} = (5, 17, 23, 1)$
726 : $P_{25161} = (8, 17, 23, 1)$
727 : $P_{25249} = (0, 20, 23, 1)$
728 : $P_{25254} = (5, 20, 23, 1)$
729 : $P_{25416} = (7, 25, 23, 1)$
730 : $P_{25417} = (8, 25, 23, 1)$
731 : $P_{25442} = (1, 26, 23, 1)$
732 : $P_{25462} = (21, 26, 23, 1)$
733 : $P_{25474} = (1, 27, 23, 1)$
734 : $P_{25501} = (28, 27, 23, 1)$
735 : $P_{25554} = (17, 29, 23, 1)$
736 : $P_{25568} = (31, 29, 23, 1)$
737 : $P_{25576} = (7, 30, 23, 1)$
738 : $P_{25587} = (18, 30, 23, 1)$
739 : $P_{25647} = (14, 0, 24, 1)$
740 : $P_{25685} = (20, 1, 24, 1)$
741 : $P_{25696} = (31, 1, 24, 1)$
742 : $P_{25698} = (1, 2, 24, 1)$
743 : $P_{25720} = (23, 2, 24, 1)$
744 : $P_{25730} = (1, 3, 24, 1)$
745 : $P_{25757} = (28, 3, 24, 1)$
746 : $P_{25779} = (18, 4, 24, 1)$
747 : $P_{25788} = (27, 4, 24, 1)$
748 : $P_{25835} = (10, 6, 24, 1)$
749 : $P_{25846} = (21, 6, 24, 1)$
750 : $P_{26027} = (10, 12, 24, 1)$
751 : $P_{26034} = (17, 12, 24, 1)$
752 : $P_{26052} = (3, 13, 24, 1)$
753 : $P_{26068} = (19, 13, 24, 1)$
754 : $P_{26084} = (3, 14, 24, 1)$
755 : $P_{26095} = (14, 14, 24, 1)$
756 : $P_{26250} = (9, 19, 24, 1)$
757 : $P_{26262} = (21, 19, 24, 1)$
758 : $P_{26325} = (20, 21, 24, 1)$
759 : $P_{26328} = (23, 21, 24, 1)$
760 : $P_{26349} = (12, 22, 24, 1)$
761 : $P_{26355} = (18, 22, 24, 1)$
762 : $P_{26474} = (9, 26, 24, 1)$
763 : $P_{26477} = (12, 26, 24, 1)$
764 : $P_{26561} = (0, 29, 24, 1)$
765 : $P_{26578} = (17, 29, 24, 1)$
766 : $P_{26612} = (19, 30, 24, 1)$
767 : $P_{26624} = (31, 30, 24, 1)$

768 : $P_{26652} = (27, 31, 24, 1)$
769 : $P_{26653} = (28, 31, 24, 1)$
770 : $P_{26671} = (14, 0, 25, 1)$
771 : $P_{26700} = (11, 1, 25, 1)$
772 : $P_{26716} = (27, 1, 25, 1)$
773 : $P_{26746} = (25, 2, 25, 1)$
774 : $P_{26749} = (28, 2, 25, 1)$
775 : $P_{26889} = (8, 7, 25, 1)$
776 : $P_{26904} = (23, 7, 25, 1)$
777 : $P_{26988} = (11, 10, 25, 1)$
778 : $P_{27003} = (26, 10, 25, 1)$
779 : $P_{27044} = (3, 12, 25, 1)$
780 : $P_{27070} = (29, 12, 25, 1)$
781 : $P_{27119} = (14, 14, 25, 1)$
782 : $P_{27126} = (21, 14, 25, 1)$
783 : $P_{27140} = (3, 15, 25, 1)$
784 : $P_{27145} = (8, 15, 25, 1)$
785 : $P_{27192} = (23, 16, 25, 1)$
786 : $P_{27195} = (26, 16, 25, 1)$
787 : $P_{27201} = (0, 17, 25, 1)$
788 : $P_{27230} = (29, 17, 25, 1)$
789 : $P_{27307} = (10, 20, 25, 1)$
790 : $P_{27310} = (13, 20, 25, 1)$
791 : $P_{27461} = (4, 25, 25, 1)$
792 : $P_{27470} = (13, 25, 25, 1)$
793 : $P_{27496} = (7, 26, 25, 1)$
794 : $P_{27516} = (27, 26, 25, 1)$
795 : $P_{27542} = (21, 27, 25, 1)$
796 : $P_{27546} = (25, 27, 25, 1)$
797 : $P_{27589} = (4, 29, 25, 1)$
798 : $P_{27592} = (7, 29, 25, 1)$
799 : $P_{27627} = (10, 30, 25, 1)$
800 : $P_{27645} = (28, 30, 25, 1)$
801 : $P_{27704} = (23, 0, 26, 1)$
802 : $P_{27725} = (12, 1, 26, 1)$
803 : $P_{27731} = (18, 1, 26, 1)$
804 : $P_{27755} = (10, 2, 26, 1)$
805 : $P_{27764} = (19, 2, 26, 1)$
806 : $P_{27786} = (9, 3, 26, 1)$
807 : $P_{27791} = (14, 3, 26, 1)$
808 : $P_{27862} = (21, 5, 26, 1)$
809 : $P_{27869} = (28, 5, 26, 1)$
810 : $P_{27890} = (17, 6, 26, 1)$
811 : $P_{27904} = (31, 6, 26, 1)$
812 : $P_{27938} = (1, 8, 26, 1)$
813 : $P_{27947} = (10, 8, 26, 1)$
814 : $P_{27970} = (1, 9, 26, 1)$
815 : $P_{27989} = (20, 9, 26, 1)$
816 : $P_{28010} = (9, 10, 26, 1)$
817 : $P_{28028} = (27, 10, 26, 1)$
818 : $P_{28109} = (12, 13, 26, 1)$
819 : $P_{28111} = (14, 13, 26, 1)$
820 : $P_{28196} = (3, 16, 26, 1)$
821 : $P_{28214} = (21, 16, 26, 1)$
822 : $P_{28244} = (19, 17, 26, 1)$
823 : $P_{28252} = (27, 17, 26, 1)$
824 : $P_{28292} = (3, 19, 26, 1)$
825 : $P_{28307} = (18, 19, 26, 1)$
826 : $P_{28434} = (17, 23, 26, 1)$
827 : $P_{28440} = (23, 23, 26, 1)$
828 : $P_{28509} = (28, 25, 26, 1)$
829 : $P_{28512} = (31, 25, 26, 1)$
830 : $P_{28609} = (0, 29, 26, 1)$
831 : $P_{28629} = (20, 29, 26, 1)$
832 : $P_{28728} = (23, 0, 27, 1)$
833 : $P_{28789} = (20, 2, 27, 1)$
834 : $P_{28794} = (25, 2, 27, 1)$
835 : $P_{28842} = (9, 4, 27, 1)$
836 : $P_{28852} = (19, 4, 27, 1)$
837 : $P_{28909} = (12, 6, 27, 1)$
838 : $P_{28924} = (27, 6, 27, 1)$
839 : $P_{29017} = (24, 9, 27, 1)$
840 : $P_{29022} = (29, 9, 27, 1)$
841 : $P_{29037} = (12, 10, 27, 1)$
842 : $P_{29041} = (16, 10, 27, 1)$
843 : $P_{29130} = (9, 13, 27, 1)$
844 : $P_{29143} = (22, 13, 27, 1)$
845 : $P_{29260} = (11, 17, 27, 1)$
846 : $P_{29273} = (24, 17, 27, 1)$
847 : $P_{29285} = (4, 18, 27, 1)$
848 : $P_{29295} = (14, 18, 27, 1)$
849 : $P_{29345} = (0, 20, 27, 1)$
850 : $P_{29374} = (29, 20, 27, 1)$
851 : $P_{29413} = (4, 22, 27, 1)$
852 : $P_{29429} = (20, 22, 27, 1)$
853 : $P_{29460} = (19, 23, 27, 1)$
854 : $P_{29464} = (23, 23, 27, 1)$
855 : $P_{29548} = (11, 26, 27, 1)$
856 : $P_{29553} = (16, 26, 27, 1)$
857 : $P_{29591} = (22, 27, 27, 1)$
858 : $P_{29594} = (25, 27, 27, 1)$
859 : $P_{29603} = (2, 28, 27, 1)$
860 : $P_{29615} = (14, 28, 27, 1)$
861 : $P_{29636} = (3, 29, 27, 1)$
862 : $P_{29660} = (27, 29, 27, 1)$
863 : $P_{29667} = (2, 30, 27, 1)$
864 : $P_{29668} = (3, 30, 27, 1)$
865 : $P_{29737} = (8, 0, 28, 1)$
866 : $P_{29772} = (11, 1, 28, 1)$
867 : $P_{29786} = (25, 1, 28, 1)$
868 : $P_{29869} = (12, 4, 28, 1)$
869 : $P_{29871} = (14, 4, 28, 1)$
870 : $P_{29892} = (3, 5, 28, 1)$
871 : $P_{29908} = (19, 5, 28, 1)$
872 : $P_{29921} = (0, 6, 28, 1)$
873 : $P_{29924} = (3, 6, 28, 1)$
874 : $P_{29993} = (8, 8, 28, 1)$
875 : $P_{29997} = (12, 8, 28, 1)$

876 : $P_{30060} = (11, 10, 28, 1)$
877 : $P_{30063} = (14, 10, 28, 1)$
878 : $P_{30088} = (7, 11, 28, 1)$
879 : $P_{30097} = (16, 11, 28, 1)$
880 : $P_{30114} = (1, 12, 28, 1)$
881 : $P_{30120} = (7, 12, 28, 1)$
882 : $P_{30146} = (1, 13, 28, 1)$
883 : $P_{30166} = (21, 13, 28, 1)$
884 : $P_{30201} = (24, 14, 28, 1)$
885 : $P_{30208} = (31, 14, 28, 1)$
886 : $P_{30278} = (5, 17, 28, 1)$
887 : $P_{30304} = (31, 17, 28, 1)$
888 : $P_{30374} = (5, 20, 28, 1)$
889 : $P_{30384} = (15, 20, 28, 1)$
890 : $P_{30452} = (19, 22, 28, 1)$
891 : $P_{30457} = (24, 22, 28, 1)$
892 : $P_{30518} = (21, 24, 28, 1)$
893 : $P_{30522} = (25, 24, 28, 1)$
894 : $P_{30608} = (15, 27, 28, 1)$
895 : $P_{30609} = (16, 27, 28, 1)$
896 : $P_{30761} = (8, 0, 29, 1)$
897 : $P_{30801} = (16, 1, 29, 1)$
898 : $P_{30803} = (18, 1, 29, 1)$
899 : $P_{30834} = (17, 2, 29, 1)$
900 : $P_{30838} = (21, 2, 29, 1)$
901 : $P_{30849} = (0, 3, 29, 1)$
902 : $P_{30855} = (6, 3, 29, 1)$
903 : $P_{30919} = (6, 5, 29, 1)$
904 : $P_{30925} = (12, 5, 29, 1)$
905 : $P_{30968} = (23, 6, 29, 1)$
906 : $P_{30972} = (27, 6, 29, 1)$
907 : $P_{31017} = (8, 8, 29, 1)$
908 : $P_{31033} = (24, 8, 29, 1)$
909 : $P_{31053} = (12, 9, 29, 1)$
910 : $P_{31071} = (30, 9, 29, 1)$
911 : $P_{31080} = (7, 10, 29, 1)$
912 : $P_{31092} = (19, 10, 29, 1)$
913 : $P_{31176} = (7, 13, 29, 1)$
914 : $P_{31198} = (29, 13, 29, 1)$
915 : $P_{31289} = (24, 16, 29, 1)$
916 : $P_{31294} = (29, 16, 29, 1)$
917 : $P_{31313} = (16, 17, 29, 1)$
918 : $P_{31320} = (23, 17, 29, 1)$
919 : $P_{31378} = (17, 19, 29, 1)$
920 : $P_{31379} = (18, 19, 29, 1)$
921 : $P_{31510} = (21, 23, 29, 1)$
922 : $P_{31519} = (30, 23, 29, 1)$
923 : $P_{31557} = (4, 25, 29, 1)$
924 : $P_{31572} = (19, 25, 29, 1)$
925 : $P_{31685} = (4, 29, 29, 1)$
926 : $P_{31708} = (27, 29, 29, 1)$
927 : $P_{31794} = (17, 0, 30, 1)$
928 : $P_{31855} = (14, 2, 30, 1)$
929 : $P_{31872} = (31, 2, 30, 1)$
930 : $P_{31970} = (1, 6, 30, 1)$
931 : $P_{31992} = (23, 6, 30, 1)$
932 : $P_{32002} = (1, 7, 30, 1)$
933 : $P_{32014} = (13, 7, 30, 1)$
934 : $P_{32067} = (2, 9, 30, 1)$
935 : $P_{32087} = (22, 9, 30, 1)$
936 : $P_{32110} = (13, 10, 30, 1)$
937 : $P_{32115} = (18, 10, 30, 1)$
938 : $P_{32131} = (2, 11, 30, 1)$
939 : $P_{32136} = (7, 11, 30, 1)$
940 : $P_{32168} = (7, 12, 30, 1)$
941 : $P_{32175} = (14, 12, 30, 1)$
942 : $P_{32196} = (3, 13, 30, 1)$
943 : $P_{32209} = (16, 13, 30, 1)$
944 : $P_{32228} = (3, 14, 30, 1)$
945 : $P_{32252} = (27, 14, 30, 1)$
946 : $P_{32281} = (24, 15, 30, 1)$
947 : $P_{32283} = (26, 15, 30, 1)$
948 : $P_{32338} = (17, 17, 30, 1)$
949 : $P_{32344} = (23, 17, 30, 1)$
950 : $P_{32475} = (26, 21, 30, 1)$
951 : $P_{32476} = (27, 21, 30, 1)$
952 : $P_{32521} = (8, 23, 30, 1)$
953 : $P_{32537} = (24, 23, 30, 1)$
954 : $P_{32545} = (0, 24, 30, 1)$
955 : $P_{32563} = (18, 24, 30, 1)$
956 : $P_{32721} = (16, 29, 30, 1)$
957 : $P_{32736} = (31, 29, 30, 1)$
958 : $P_{32777} = (8, 31, 30, 1)$
959 : $P_{32791} = (22, 31, 30, 1)$
960 : $P_{32818} = (17, 0, 31, 1)$
961 : $P_{32884} = (19, 2, 31, 1)$
962 : $P_{32893} = (28, 2, 31, 1)$
963 : $P_{32943} = (14, 4, 31, 1)$
964 : $P_{32945} = (16, 4, 31, 1)$
965 : $P_{33004} = (11, 6, 31, 1)$
966 : $P_{33019} = (26, 6, 31, 1)$
967 : $P_{33107} = (18, 9, 31, 1)$
968 : $P_{33119} = (30, 9, 31, 1)$
969 : $P_{33135} = (14, 10, 31, 1)$
970 : $P_{33145} = (24, 10, 31, 1)$
971 : $P_{33228} = (11, 13, 31, 1)$
972 : $P_{33242} = (25, 13, 31, 1)$
973 : $P_{33362} = (17, 17, 31, 1)$
974 : $P_{33364} = (19, 17, 31, 1)$
975 : $P_{33377} = (0, 18, 31, 1)$
976 : $P_{33401} = (24, 18, 31, 1)$
977 : $P_{33457} = (16, 20, 31, 1)$
978 : $P_{33466} = (25, 20, 31, 1)$
979 : $P_{33515} = (10, 22, 31, 1)$
980 : $P_{33517} = (12, 22, 31, 1)$
981 : $P_{33550} = (13, 23, 31, 1)$
982 : $P_{33567} = (30, 23, 31, 1)$
983 : $P_{33645} = (12, 26, 31, 1)$

984 : $P_{33646} = (13, 26, 31, 1)$
985 : $P_{33671} = (6, 27, 31, 1)$
986 : $P_{33683} = (18, 27, 31, 1)$
987 : $P_{33707} = (10, 28, 31, 1)$
988 : $P_{33723} = (26, 28, 31, 1)$
989 : $P_{33732} = (3, 29, 31, 1)$
990 : $P_{33735} = (6, 29, 31, 1)$
991 : $P_{33764} = (3, 30, 31, 1)$
992 : $P_{33789} = (28, 30, 31, 1)$

Line Intersection Graph

	0	1	2	3
0	0	1	1	1
1	1	0	0	1
2	1	0	0	0
3	1	1	0	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3
in point	P_0	P_1	P_5

Line 1 intersects

Line	ℓ_0	ℓ_3
in point	P_0	P_{2082}

Line 2 intersects

Line	ℓ_0
in point	P_1

Line 3 intersects

Line	ℓ_0	ℓ_1
in point	P_5	P_{2082}

The surface has 1121 points:
Too many to print.