Rank-74053 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 1, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is -2112846779

General information

Number of lines	4
Number of points	1089
Number of singular points	1
Number of Eckardt points	1
Number of double points	1
Number of single points	127
Number of points off lines	960
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33^4
Type of lines on points	3, 2, 1^{127}, 0^{960}

Singular Points

The surface has 1 singular points:

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

The 4 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{1024} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{1024} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

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

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

$$\ell_3 = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082433} = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082433} = \mathbf{Pl}(0,1,0,1,0,0)_{97}$$

Rank of lines: (1024, 1083424, 34848, 1082433)
Rank of points on Klein quadric: (2, 1, 34, 97)

Eckardt Points

The surface has 1 Eckardt points:
$0 : P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$.

Double Points

The surface has 1 Double points:
The double points on the surface are:

$P_3 = (0,0,0,1) = \ell_1 \cap \ell_3$

Single Points

The surface has 127 single points:
The single points on the surface are:

$0 : P_0 = (1,0,0,0)$ lies on line ℓ_0
$1 : P_{36} = (1,0,1,0)$ lies on line ℓ_0
$2 : P_{37} = (2,0,1,0)$ lies on line ℓ_0
$3 : P_{38} = (3,0,1,0)$ lies on line ℓ_0
$4 : P_{39} = (4,0,1,0)$ lies on line ℓ_0
$5 : P_{40} = (5,0,1,0)$ lies on line ℓ_0
$6 : P_{41} = (6,0,1,0)$ lies on line ℓ_0
$7 : P_{42} = (7,0,1,0)$ lies on line ℓ_0
$8 : P_{43} = (8,0,1,0)$ lies on line ℓ_0
$9 : P_{44} = (9,0,1,0)$ lies on line ℓ_0
$10 : P_{45} = (10,0,1,0)$ lies on line ℓ_0
$11 : P_{46} = (11,0,1,0)$ lies on line ℓ_0
$12 : P_{47} = (12,0,1,0)$ lies on line ℓ_0
$13 : P_{48} = (13,0,1,0)$ lies on line ℓ_0
$14 : P_{49} = (14,0,1,0)$ lies on line ℓ_0
$15 : P_{50} = (15,0,1,0)$ lies on line ℓ_0
$16 : P_{51} = (16,0,1,0)$ lies on line ℓ_0
$17 : P_{52} = (17,0,1,0)$ lies on line ℓ_0
$18 : P_{53} = (18,0,1,0)$ lies on line ℓ_0
$19 : P_{54} = (19,0,1,0)$ lies on line ℓ_0
$20 : P_{55} = (20,0,1,0)$ lies on line ℓ_0
$21 : P_{56} = (21,0,1,0)$ lies on line ℓ_0
$22 : P_{57} = (22,0,1,0)$ lies on line ℓ_0
$23 : P_{58} = (23,0,1,0)$ lies on line ℓ_0
$24 : P_{59} = (24,0,1,0)$ lies on line ℓ_0
$25 : P_{60} = (25,0,1,0)$ lies on line ℓ_0
$26 : P_{61} = (26,0,1,0)$ lies on line ℓ_0
$27 : P_{62} = (27,0,1,0)$ lies on line ℓ_0
$28 : P_{63} = (28,0,1,0)$ lies on line ℓ_0
$29 : P_{64} = (29,0,1,0)$ lies on line ℓ_0
$30 : P_{65} = (30,0,1,0)$ lies on line ℓ_0
$31 : P_{66} = (31,0,1,0)$ lies on line ℓ_0
$32 : P_{67} = (0,1,1,0)$ lies on line ℓ_3
$33 : P_{1059} = (1,0,0,1)$ lies on line ℓ_2
$34 : P_{2082} = (0,0,1,1)$ lies on line ℓ_1
$35 : P_{2083} = (1,0,1,1)$ lies on line ℓ_2
$36 : P_{2114} = (0,1,1,1)$ lies on line ℓ_3
$37 : P_{3105} = (0,0,2,1)$ lies on line ℓ_1
$38 : P_{3106} = (1,0,2,1)$ lies on line ℓ_2
$39 : P_{3169} = (0,2,2,1)$ lies on line ℓ_3
$40 : P_{4129} = (0,0,3,1)$ lies on line ℓ_1
$41 : P_{4130} = (1,0,3,1)$ lies on line ℓ_2
$42 : P_{4225} = (0,3,3,1)$ lies on line ℓ_3
$43 : P_{5153} = (0,0,4,1)$ lies on line ℓ_1
$44 : P_{5154} = (1,0,4,1)$ lies on line ℓ_2
$45 : P_{5281} = (0,4,4,1)$ lies on line ℓ_3

46 : $P_{6177} = (0, 0, 5, 1)$ lies on line ℓ_1
47 : $P_{6178} = (1, 0, 5, 1)$ lies on line ℓ_2
48 : $P_{6337} = (0, 5, 5, 1)$ lies on line ℓ_3
49 : $P_{7201} = (0, 0, 6, 1)$ lies on line ℓ_1
50 : $P_{7202} = (1, 0, 6, 1)$ lies on line ℓ_2
51 : $P_{7393} = (0, 6, 6, 1)$ lies on line ℓ_3
52 : $P_{8225} = (0, 0, 7, 1)$ lies on line ℓ_1
53 : $P_{8226} = (1, 0, 7, 1)$ lies on line ℓ_2
54 : $P_{8449} = (0, 7, 7, 1)$ lies on line ℓ_3
55 : $P_{9249} = (0, 0, 8, 1)$ lies on line ℓ_1
56 : $P_{9250} = (1, 0, 8, 1)$ lies on line ℓ_2
57 : $P_{9505} = (0, 8, 8, 1)$ lies on line ℓ_3
58 : $P_{10273} = (0, 0, 9, 1)$ lies on line ℓ_1
59 : $P_{10274} = (1, 0, 9, 1)$ lies on line ℓ_2
60 : $P_{10561} = (0, 9, 9, 1)$ lies on line ℓ_3
61 : $P_{11297} = (0, 0, 10, 1)$ lies on line ℓ_1
62 : $P_{11298} = (1, 0, 10, 1)$ lies on line ℓ_2
63 : $P_{11617} = (0, 10, 10, 1)$ lies on line ℓ_3
64 : $P_{12321} = (0, 0, 11, 1)$ lies on line ℓ_1
65 : $P_{12322} = (1, 0, 11, 1)$ lies on line ℓ_2
66 : $P_{12673} = (0, 11, 11, 1)$ lies on line ℓ_3
67 : $P_{13345} = (0, 0, 12, 1)$ lies on line ℓ_1
68 : $P_{13346} = (1, 0, 12, 1)$ lies on line ℓ_2
69 : $P_{13729} = (0, 12, 12, 1)$ lies on line ℓ_3
70 : $P_{14369} = (0, 0, 13, 1)$ lies on line ℓ_1
71 : $P_{14370} = (1, 0, 13, 1)$ lies on line ℓ_2
72 : $P_{14785} = (0, 13, 13, 1)$ lies on line ℓ_3
73 : $P_{15393} = (0, 0, 14, 1)$ lies on line ℓ_1
74 : $P_{15394} = (1, 0, 14, 1)$ lies on line ℓ_2
75 : $P_{15841} = (0, 14, 14, 1)$ lies on line ℓ_3
76 : $P_{16417} = (0, 0, 15, 1)$ lies on line ℓ_1
77 : $P_{16418} = (1, 0, 15, 1)$ lies on line ℓ_2
78 : $P_{16897} = (0, 15, 15, 1)$ lies on line ℓ_3
79 : $P_{17441} = (0, 0, 16, 1)$ lies on line ℓ_1
80 : $P_{17442} = (1, 0, 16, 1)$ lies on line ℓ_2
81 : $P_{17953} = (0, 16, 16, 1)$ lies on line ℓ_3
82 : $P_{18465} = (0, 0, 17, 1)$ lies on line ℓ_1
83 : $P_{18466} = (1, 0, 17, 1)$ lies on line ℓ_2
84 : $P_{19009} = (0, 17, 17, 1)$ lies on line ℓ_3
85 : $P_{19489} = (0, 0, 18, 1)$ lies on line ℓ_1
86 : $P_{19490} = (1, 0, 18, 1)$ lies on line ℓ_2
87 : $P_{20065} = (0, 18, 18, 1)$ lies on line ℓ_3
88 : $P_{20513} = (0, 0, 19, 1)$ lies on line ℓ_1
89 : $P_{20514} = (1, 0, 19, 1)$ lies on line ℓ_2
90 : $P_{21121} = (0, 19, 19, 1)$ lies on line ℓ_3
91 : $P_{21537} = (0, 0, 20, 1)$ lies on line ℓ_1
92 : $P_{21538} = (1, 0, 20, 1)$ lies on line ℓ_2
93 : $P_{22177} = (0, 20, 20, 1)$ lies on line ℓ_3
94 : $P_{22561} = (0, 0, 21, 1)$ lies on line ℓ_1
95 : $P_{22562} = (1, 0, 21, 1)$ lies on line ℓ_2
96 : $P_{23233} = (0, 21, 21, 1)$ lies on line ℓ_3
97 : $P_{23585} = (0, 0, 22, 1)$ lies on line ℓ_1
98 : $P_{23586} = (1, 0, 22, 1)$ lies on line ℓ_2
99 : $P_{24289} = (0, 22, 22, 1)$ lies on line ℓ_3
100 : $P_{24609} = (0, 0, 23, 1)$ lies on line ℓ_1
101 : $P_{24610} = (1, 0, 23, 1)$ lies on line ℓ_2
102 : $P_{25345} = (0, 23, 23, 1)$ lies on line ℓ_3
103 : $P_{25633} = (0, 0, 24, 1)$ lies on line ℓ_1
104 : $P_{25634} = (1, 0, 24, 1)$ lies on line ℓ_2
105 : $P_{26401} = (0, 24, 24, 1)$ lies on line ℓ_3
106 : $P_{26657} = (0, 0, 25, 1)$ lies on line ℓ_1
107 : $P_{26658} = (1, 0, 25, 1)$ lies on line ℓ_2
108 : $P_{27457} = (0, 25, 25, 1)$ lies on line ℓ_3
109 : $P_{27681} = (0, 0, 26, 1)$ lies on line ℓ_1
110 : $P_{27682} = (1, 0, 26, 1)$ lies on line ℓ_2
111 : $P_{28513} = (0, 26, 26, 1)$ lies on line ℓ_3
112 : $P_{28705} = (0, 0, 27, 1)$ lies on line ℓ_1
113 : $P_{28706} = (1, 0, 27, 1)$ lies on line ℓ_2
114 : $P_{29569} = (0, 27, 27, 1)$ lies on line ℓ_3
115 : $P_{29729} = (0, 0, 28, 1)$ lies on line ℓ_1
116 : $P_{29730} = (1, 0, 28, 1)$ lies on line ℓ_2
117 : $P_{30625} = (0, 28, 28, 1)$ lies on line ℓ_3
118 : $P_{30753} = (0, 0, 29, 1)$ lies on line ℓ_1
119 : $P_{30754} = (1, 0, 29, 1)$ lies on line ℓ_2
120 : $P_{31681} = (0, 29, 29, 1)$ lies on line ℓ_3
121 : $P_{31777} = (0, 0, 30, 1)$ lies on line ℓ_1
122 : $P_{31778} = (1, 0, 30, 1)$ lies on line ℓ_2
123 : $P_{32737} = (0, 30, 30, 1)$ lies on line ℓ_3
124 : $P_{32801} = (0, 0, 31, 1)$ lies on line ℓ_1
125 : $P_{32802} = (1, 0, 31, 1)$ lies on line ℓ_2
126 : $P_{33793} = (0, 31, 31, 1)$ lies on line ℓ_3

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 : $P_{105} = (6, 2, 1, 0)$
1 : $P_{137} = (6, 3, 1, 0)$
2 : $P_{183} = (20, 4, 1, 0)$
3 : $P_{215} = (20, 5, 1, 0)$
4 : $P_{245} = (18, 6, 1, 0)$
5 : $P_{277} = (18, 7, 1, 0)$

$6:\ P_{293} = (2, 8, 1, 0)$
$7:\ P_{325} = (2, 9, 1, 0)$
$8:\ P_{359} = (4, 10, 1, 0)$
$9:\ P_{391} = (4, 11, 1, 0)$
$10:\ P_{441} = (22, 12, 1, 0)$
$11:\ P_{473} = (22, 13, 1, 0)$
$12:\ P_{499} = (16, 14, 1, 0)$
$13:\ P_{531} = (16, 15, 1, 0)$
$14:\ P_{576} = (29, 16, 1, 0)$
$15:\ P_{608} = (29, 17, 1, 0)$
$16:\ P_{638} = (27, 18, 1, 0)$
$17:\ P_{670} = (27, 19, 1, 0)$
$18:\ P_{684} = (9, 20, 1, 0)$
$19:\ P_{716} = (9, 21, 1, 0)$
$20:\ P_{754} = (15, 22, 1, 0)$
$21:\ P_{786} = (15, 23, 1, 0)$
$22:\ P_{834} = (31, 24, 1, 0)$
$23:\ P_{866} = (31, 25, 1, 0)$
$24:\ P_{892} = (25, 26, 1, 0)$
$25:\ P_{924} = (25, 27, 1, 0)$
$26:\ P_{942} = (11, 28, 1, 0)$
$27:\ P_{974} = (11, 29, 1, 0)$
$28:\ P_{1008} = (13, 30, 1, 0)$
$29:\ P_{1040} = (13, 31, 1, 0)$
$30:\ P_{1176} = (22, 3, 0, 1)$
$31:\ P_{1177} = (23, 3, 0, 1)$
$32:\ P_{1242} = (24, 5, 0, 1)$
$33:\ P_{1243} = (25, 5, 0, 1)$
$34:\ P_{1292} = (10, 7, 0, 1)$
$35:\ P_{1293} = (11, 7, 0, 1)$
$36:\ P_{1372} = (26, 9, 0, 1)$
$37:\ P_{1373} = (27, 9, 0, 1)$
$38:\ P_{1412} = (2, 11, 0, 1)$
$39:\ P_{1413} = (3, 11, 0, 1)$
$40:\ P_{1462} = (20, 12, 0, 1)$
$41:\ P_{1463} = (21, 12, 0, 1)$
$42:\ P_{1542} = (4, 15, 0, 1)$
$43:\ P_{1543} = (5, 15, 0, 1)$
$44:\ P_{1608} = (6, 17, 0, 1)$
$45:\ P_{1609} = (7, 17, 0, 1)$
$46:\ P_{1646} = (12, 18, 0, 1)$
$47:\ P_{1647} = (13, 18, 0, 1)$
$48:\ P_{1744} = (14, 21, 0, 1)$
$49:\ P_{1745} = (15, 21, 0, 1)$
$50:\ P_{1812} = (18, 23, 0, 1)$
$51:\ P_{1813} = (19, 23, 0, 1)$
$52:\ P_{1834} = (8, 24, 0, 1)$
$53:\ P_{1835} = (9, 24, 0, 1)$
$54:\ P_{1918} = (28, 26, 0, 1)$
$55:\ P_{1919} = (29, 26, 0, 1)$
$56:\ P_{1984} = (30, 28, 0, 1)$
$57:\ P_{1985} = (31, 28, 0, 1)$
$58:\ P_{2066} = (16, 31, 0, 1)$
$59:\ P_{2067} = (17, 31, 0, 1)$
$60:\ P_{2158} = (13, 2, 1, 1)$
$61:\ P_{2159} = (14, 2, 1, 1)$
$62:\ P_{2205} = (28, 3, 1, 1)$
$63:\ P_{2207} = (30, 3, 1, 1)$
$64:\ P_{2236} = (27, 4, 1, 1)$
$65:\ P_{2239} = (30, 4, 1, 1)$
$66:\ P_{2260} = (19, 5, 1, 1)$
$67:\ P_{2264} = (23, 5, 1, 1)$
$68:\ P_{2298} = (25, 6, 1, 1)$
$69:\ P_{2303} = (30, 6, 1, 1)$
$70:\ P_{2358} = (21, 8, 1, 1)$
$71:\ P_{2365} = (28, 8, 1, 1)$
$72:\ P_{2424} = (23, 10, 1, 1)$
$73:\ P_{2429} = (28, 10, 1, 1)$
$74:\ P_{2472} = (7, 12, 1, 1)$
$75:\ P_{2475} = (10, 12, 1, 1)$
$76:\ P_{2501} = (4, 13, 1, 1)$
$77:\ P_{2505} = (8, 13, 1, 1)$
$78:\ P_{2552} = (23, 14, 1, 1)$
$79:\ P_{2553} = (24, 14, 1, 1)$
$80:\ P_{2595} = (2, 16, 1, 1)$
$81:\ P_{2612} = (19, 16, 1, 1)$
$82:\ P_{2633} = (8, 17, 1, 1)$
$83:\ P_{2649} = (24, 17, 1, 1)$
$84:\ P_{2696} = (7, 19, 1, 1)$
$85:\ P_{2710} = (21, 19, 1, 1)$
$86:\ P_{2727} = (6, 20, 1, 1)$
$87:\ P_{2740} = (19, 20, 1, 1)$
$88:\ P_{2795} = (10, 22, 1, 1)$
$89:\ P_{2814} = (29, 22, 1, 1)$
$90:\ P_{2895} = (14, 25, 1, 1)$
$91:\ P_{2903} = (22, 25, 1, 1)$
$92:\ P_{2927} = (14, 26, 1, 1)$
$93:\ P_{2934} = (21, 26, 1, 1)$
$94:\ P_{2955} = (10, 27, 1, 1)$
$95:\ P_{2961} = (16, 27, 1, 1)$
$96:\ P_{3017} = (8, 29, 1, 1)$
$97:\ P_{3029} = (20, 29, 1, 1)$
$98:\ P_{3048} = (7, 30, 1, 1)$
$99:\ P_{3065} = (24, 30, 1, 1)$
$100:\ P_{3174} = (5, 2, 2, 1)$
$101:\ P_{3225} = (24, 3, 2, 1)$
$102:\ P_{3232} = (31, 3, 2, 1)$
$103:\ P_{3240} = (7, 4, 2, 1)$
$104:\ P_{3247} = (14, 4, 2, 1)$
$105:\ P_{3268} = (3, 5, 2, 1)$
$106:\ P_{3273} = (8, 5, 2, 1)$
$107:\ P_{3366} = (5, 8, 2, 1)$
$108:\ P_{3381} = (20, 8, 2, 1)$
$109:\ P_{3428} = (3, 10, 2, 1)$
$110:\ P_{3447} = (22, 10, 2, 1)$
$111:\ P_{3490} = (1, 12, 2, 1)$
$112:\ P_{3513} = (24, 12, 2, 1)$
$113:\ P_{3524} = (3, 13, 2, 1)$

$114: P_{3545} = (24, 13, 2, 1)$
$115: P_{3554} = (1, 14, 2, 1)$
$116: P_{3581} = (28, 14, 2, 1)$
$117: P_{3667} = (18, 17, 2, 1)$
$118: P_{3669} = (20, 17, 2, 1)$
$119: P_{3683} = (2, 18, 2, 1)$
$120: P_{3768} = (23, 20, 2, 1)$
$121: P_{3772} = (27, 20, 2, 1)$
$122: P_{3781} = (4, 21, 2, 1)$
$123: P_{3787} = (10, 21, 2, 1)$
$124: P_{3975} = (6, 27, 2, 1)$
$125: P_{3989} = (20, 27, 2, 1)$
$126: P_{4078} = (13, 30, 2, 1)$
$127: P_{4086} = (21, 30, 2, 1)$
$128: P_{4173} = (12, 1, 3, 1)$
$129: P_{4175} = (14, 1, 3, 1)$
$130: P_{4229} = (4, 3, 3, 1)$
$131: P_{4263} = (6, 4, 3, 1)$
$132: P_{4268} = (11, 4, 3, 1)$
$133: P_{4394} = (9, 8, 3, 1)$
$134: P_{4401} = (16, 8, 3, 1)$
$135: P_{4425} = (8, 9, 3, 1)$
$136: P_{4435} = (18, 9, 3, 1)$
$137: P_{4528} = (15, 12, 3, 1)$
$138: P_{4539} = (26, 12, 3, 1)$
$139: P_{4590} = (13, 14, 3, 1)$
$140: P_{4607} = (30, 14, 3, 1)$
$141: P_{4612} = (3, 15, 3, 1)$
$142: P_{4628} = (19, 15, 3, 1)$
$143: P_{4677} = (4, 17, 3, 1)$
$144: P_{4692} = (19, 17, 3, 1)$
$145: P_{4783} = (14, 20, 3, 1)$
$146: P_{4791} = (22, 20, 3, 1)$
$147: P_{4847} = (14, 22, 3, 1)$
$148: P_{4849} = (16, 22, 3, 1)$
$149: P_{5030} = (5, 28, 3, 1)$
$150: P_{5073} = (16, 29, 3, 1)$
$151: P_{5076} = (19, 29, 3, 1)$
$152: P_{5123} = (2, 31, 3, 1)$
$153: P_{5128} = (7, 31, 3, 1)$
$154: P_{5237} = (20, 2, 4, 1)$
$155: P_{5246} = (29, 2, 4, 1)$
$156: P_{5298} = (17, 4, 4, 1)$
$157: P_{5320} = (7, 5, 4, 1)$
$158: P_{5331} = (18, 5, 4, 1)$
$159: P_{5445} = (4, 9, 4, 1)$
$160: P_{5490} = (17, 10, 4, 1)$
$161: P_{5502} = (29, 10, 4, 1)$
$162: P_{5546} = (9, 12, 4, 1)$
$163: P_{5566} = (29, 12, 4, 1)$
$164: P_{5606} = (5, 14, 4, 1)$
$165: P_{5626} = (25, 14, 4, 1)$
$166: P_{5686} = (21, 16, 4, 1)$
$167: P_{5695} = (30, 16, 4, 1)$
$168: P_{5702} = (5, 17, 4, 1)$
$169: P_{5707} = (10, 17, 4, 1)$
$170: P_{5788} = (27, 19, 4, 1)$
$171: P_{5789} = (28, 19, 4, 1)$
$172: P_{5986} = (1, 26, 4, 1)$
$173: P_{5992} = (7, 26, 4, 1)$
$174: P_{6022} = (5, 27, 4, 1)$
$175: P_{6024} = (7, 27, 4, 1)$
$176: P_{6063} = (14, 28, 4, 1)$
$177: P_{6065} = (16, 28, 4, 1)$
$178: P_{6083} = (2, 29, 4, 1)$
$179: P_{6105} = (24, 29, 4, 1)$
$180: P_{6114} = (1, 30, 4, 1)$
$181: P_{6136} = (23, 30, 4, 1)$
$182: P_{6235} = (26, 1, 5, 1)$
$183: P_{6239} = (30, 1, 5, 1)$
$184: P_{6353} = (16, 5, 5, 1)$
$185: P_{6508} = (11, 10, 5, 1)$
$186: P_{6510} = (13, 10, 5, 1)$
$187: P_{6538} = (9, 11, 5, 1)$
$188: P_{6539} = (10, 11, 5, 1)$
$189: P_{6569} = (8, 12, 5, 1)$
$190: P_{6577} = (16, 12, 5, 1)$
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599 : $P_{20443} = (26, 29, 18, 1)$
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602 : $P_{20657} = (16, 4, 19, 1)$
603 : $P_{20664} = (23, 4, 19, 1)$
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606 : $P_{20743} = (6, 7, 19, 1)$
607 : $P_{20754} = (17, 7, 19, 1)$
608 : $P_{20808} = (7, 9, 19, 1)$
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612 : $P_{20915} = (18, 12, 19, 1)$
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614 : $P_{20943} = (14, 13, 19, 1)$
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616 : $P_{20963} = (2, 14, 19, 1)$
617 : $P_{20971} = (10, 14, 19, 1)$
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621 : $P_{21043} = (18, 16, 19, 1)$
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623 : $P_{21204} = (19, 21, 19, 1)$
624 : $P_{21216} = (31, 21, 19, 1)$
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626 : $P_{21242} = (25, 22, 19, 1)$
627 : $P_{21269} = (20, 23, 19, 1)$
628 : $P_{21276} = (27, 23, 19, 1)$
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637 : $P_{21527} = (22, 31, 19, 1)$
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643 : $P_{22042} = (25, 15, 20, 1)$
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646 : $P_{22118} = (5, 18, 20, 1)$
647 : $P_{22127} = (14, 18, 20, 1)$
648 : $P_{22150} = (5, 19, 20, 1)$
649 : $P_{22171} = (26, 19, 20, 1)$
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651 : $P_{22214} = (5, 21, 20, 1)$
652 : $P_{22222} = (13, 21, 20, 1)$
653 : $P_{22284} = (11, 23, 20, 1)$

654 : $P_{22287} = (14, 23, 20, 1)$
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656 : $P_{22483} = (18, 29, 20, 1)$
657 : $P_{22508} = (11, 30, 20, 1)$
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661 : $P_{22686} = (29, 3, 21, 1)$
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666 : $P_{22761} = (8, 6, 21, 1)$
667 : $P_{22777} = (24, 6, 21, 1)$
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669 : $P_{22920} = (7, 11, 21, 1)$
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671 : $P_{22949} = (4, 12, 21, 1)$
672 : $P_{23053} = (12, 15, 21, 1)$
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677 : $P_{23212} = (11, 20, 21, 1)$
678 : $P_{23262} = (29, 21, 21, 1)$
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682 : $P_{23461} = (4, 28, 21, 1)$
683 : $P_{23478} = (21, 28, 21, 1)$
684 : $P_{23516} = (27, 29, 21, 1)$
685 : $P_{23520} = (31, 29, 21, 1)$
686 : $P_{23531} = (10, 30, 21, 1)$
687 : $P_{23541} = (20, 30, 21, 1)$
688 : $P_{23828} = (19, 7, 22, 1)$
689 : $P_{23840} = (31, 7, 22, 1)$
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691 : $P_{23910} = (5, 10, 22, 1)$
692 : $P_{23917} = (12, 10, 22, 1)$
693 : $P_{23949} = (12, 11, 22, 1)$
694 : $P_{23956} = (19, 11, 22, 1)$
695 : $P_{24018} = (17, 13, 22, 1)$
696 : $P_{24022} = (21, 13, 22, 1)$
697 : $P_{24181} = (20, 18, 22, 1)$
698 : $P_{24191} = (30, 18, 22, 1)$
699 : $P_{24313} = (24, 22, 22, 1)$
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703 : $P_{24416} = (31, 25, 22, 1)$
704 : $P_{24436} = (19, 26, 22, 1)$
705 : $P_{24441} = (24, 26, 22, 1)$
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707 : $P_{24567} = (22, 30, 22, 1)$
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709 : $P_{24721} = (16, 3, 23, 1)$
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711 : $P_{24887} = (22, 8, 23, 1)$
712 : $P_{24895} = (30, 8, 23, 1)$
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714 : $P_{25012} = (19, 12, 23, 1)$
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716 : $P_{25037} = (12, 13, 23, 1)$
717 : $P_{25129} = (8, 16, 23, 1)$
718 : $P_{25148} = (27, 16, 23, 1)$
719 : $P_{25178} = (25, 17, 23, 1)$
720 : $P_{25182} = (29, 17, 23, 1)$
721 : $P_{25188} = (3, 18, 23, 1)$
722 : $P_{25212} = (27, 18, 23, 1)$
723 : $P_{25290} = (9, 21, 23, 1)$
724 : $P_{25308} = (27, 21, 23, 1)$
725 : $P_{25330} = (17, 22, 23, 1)$
726 : $P_{25344} = (31, 22, 23, 1)$
727 : $P_{25370} = (25, 23, 23, 1)$
728 : $P_{25390} = (13, 24, 23, 1)$
729 : $P_{25400} = (23, 24, 23, 1)$
730 : $P_{25413} = (4, 25, 23, 1)$
731 : $P_{25418} = (9, 25, 23, 1)$
732 : $P_{25482} = (9, 27, 23, 1)$
733 : $P_{25488} = (15, 27, 23, 1)$
734 : $P_{25551} = (14, 29, 23, 1)$
735 : $P_{25558} = (21, 29, 23, 1)$
736 : $P_{25613} = (12, 31, 23, 1)$
737 : $P_{25629} = (28, 31, 23, 1)$
738 : $P_{25708} = (11, 2, 24, 1)$
739 : $P_{25728} = (31, 2, 24, 1)$
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741 : $P_{25820} = (27, 5, 24, 1)$
742 : $P_{25836} = (11, 6, 24, 1)$
743 : $P_{25841} = (16, 6, 24, 1)$
744 : $P_{25881} = (24, 7, 24, 1)$
745 : $P_{25884} = (27, 7, 24, 1)$
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747 : $P_{25926} = (5, 9, 24, 1)$
748 : $P_{25972} = (19, 10, 24, 1)$
749 : $P_{25978} = (25, 10, 24, 1)$
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751 : $P_{26039} = (22, 12, 24, 1)$
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754 : $P_{26203} = (26, 17, 24, 1)$
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756 : $P_{26235} = (26, 18, 24, 1)$
757 : $P_{26365} = (28, 22, 24, 1)$
758 : $P_{26367} = (30, 22, 24, 1)$
759 : $P_{26407} = (6, 24, 24, 1)$
760 : $P_{26445} = (12, 25, 24, 1)$
761 : $P_{26451} = (18, 25, 24, 1)$

762 : $P_{26473} = (8, 26, 24, 1)$
763 : $P_{26492} = (27, 26, 24, 1)$
764 : $P_{26514} = (17, 27, 24, 1)$
765 : $P_{26523} = (26, 27, 24, 1)$
766 : $P_{26531} = (2, 28, 24, 1)$
767 : $P_{26540} = (11, 28, 24, 1)$
768 : $P_{26760} = (7, 3, 25, 1)$
769 : $P_{26761} = (8, 3, 25, 1)$
770 : $P_{26864} = (15, 6, 25, 1)$
771 : $P_{26867} = (18, 6, 25, 1)$
772 : $P_{26964} = (19, 9, 25, 1)$
773 : $P_{26974} = (29, 9, 25, 1)$
774 : $P_{26995} = (18, 10, 25, 1)$
775 : $P_{27122} = (17, 14, 25, 1)$
776 : $P_{27131} = (26, 14, 25, 1)$
777 : $P_{27145} = (8, 15, 25, 1)$
778 : $P_{27163} = (26, 15, 25, 1)$
779 : $P_{27290} = (25, 19, 25, 1)$
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782 : $P_{27347} = (18, 21, 25, 1)$
783 : $P_{27429} = (4, 24, 25, 1)$
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785 : $P_{27464} = (7, 25, 25, 1)$
786 : $P_{27533} = (12, 27, 25, 1)$
787 : $P_{27549} = (28, 27, 25, 1)$
788 : $P_{27723} = (10, 1, 26, 1)$
789 : $P_{27730} = (17, 1, 26, 1)$
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791 : $P_{27770} = (25, 2, 26, 1)$
792 : $P_{27843} = (2, 5, 26, 1)$
793 : $P_{27871} = (30, 5, 26, 1)$
794 : $P_{27883} = (10, 6, 26, 1)$
795 : $P_{27902} = (29, 6, 26, 1)$
796 : $P_{28015} = (14, 10, 26, 1)$
797 : $P_{28017} = (16, 10, 26, 1)$
798 : $P_{28059} = (26, 11, 26, 1)$
799 : $P_{28063} = (30, 11, 26, 1)$
800 : $P_{28185} = (24, 15, 26, 1)$
801 : $P_{28188} = (27, 15, 26, 1)$
802 : $P_{28236} = (11, 17, 26, 1)$
803 : $P_{28237} = (12, 17, 26, 1)$
804 : $P_{28276} = (19, 18, 26, 1)$
805 : $P_{28288} = (31, 18, 26, 1)$
806 : $P_{28293} = (4, 19, 26, 1)$
807 : $P_{28307} = (18, 19, 26, 1)$
808 : $P_{28325} = (4, 20, 26, 1)$
809 : $P_{28351} = (30, 20, 26, 1)$
810 : $P_{28356} = (3, 21, 26, 1)$
811 : $P_{28515} = (2, 26, 26, 1)$
812 : $P_{28613} = (4, 29, 26, 1)$
813 : $P_{28619} = (10, 29, 26, 1)$
814 : $P_{28779} = (10, 2, 27, 1)$
815 : $P_{28793} = (24, 2, 27, 1)$
816 : $P_{28820} = (19, 3, 27, 1)$
817 : $P_{28827} = (26, 3, 27, 1)$
818 : $P_{28871} = (6, 5, 27, 1)$
819 : $P_{28896} = (31, 5, 27, 1)$
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821 : $P_{28925} = (28, 6, 27, 1)$
822 : $P_{28931} = (2, 7, 27, 1)$
823 : $P_{28937} = (8, 7, 27, 1)$
824 : $P_{28987} = (26, 8, 27, 1)$
825 : $P_{28990} = (29, 8, 27, 1)$
826 : $P_{29026} = (1, 10, 27, 1)$
827 : $P_{29046} = (21, 10, 27, 1)$
828 : $P_{29127} = (6, 13, 27, 1)$
829 : $P_{29146} = (25, 13, 27, 1)$
830 : $P_{29160} = (7, 14, 27, 1)$
831 : $P_{29169} = (16, 14, 27, 1)$
832 : $P_{29240} = (23, 16, 27, 1)$
833 : $P_{29243} = (26, 16, 27, 1)$
834 : $P_{29250} = (1, 17, 27, 1)$
835 : $P_{29272} = (23, 17, 27, 1)$
836 : $P_{29316} = (3, 19, 27, 1)$
837 : $P_{29319} = (6, 19, 27, 1)$
838 : $P_{29552} = (15, 26, 27, 1)$
839 : $P_{29560} = (23, 26, 27, 1)$
840 : $P_{29572} = (3, 27, 27, 1)$
841 : $P_{29724} = (27, 31, 27, 1)$
842 : $P_{29842} = (17, 3, 28, 1)$
843 : $P_{29870} = (13, 4, 28, 1)$
844 : $P_{29876} = (19, 4, 28, 1)$
845 : $P_{29909} = (20, 5, 28, 1)$
846 : $P_{29911} = (22, 5, 28, 1)$
847 : $P_{29966} = (13, 7, 28, 1)$
848 : $P_{29971} = (18, 7, 28, 1)$
849 : $P_{30156} = (11, 13, 28, 1)$
850 : $P_{30163} = (18, 13, 28, 1)$
851 : $P_{30226} = (17, 15, 28, 1)$
852 : $P_{30230} = (21, 15, 28, 1)$
853 : $P_{30244} = (3, 16, 28, 1)$
854 : $P_{30258} = (17, 16, 28, 1)$
855 : $P_{30289} = (16, 17, 28, 1)$
856 : $P_{30303} = (30, 17, 28, 1)$
857 : $P_{30351} = (14, 19, 28, 1)$
858 : $P_{30366} = (29, 19, 28, 1)$
859 : $P_{30376} = (7, 20, 28, 1)$
860 : $P_{30379} = (10, 20, 28, 1)$
861 : $P_{30435} = (2, 22, 28, 1)$
862 : $P_{30451} = (18, 22, 28, 1)$
863 : $P_{30481} = (16, 23, 28, 1)$
864 : $P_{30493} = (28, 23, 28, 1)$
865 : $P_{30565} = (4, 26, 28, 1)$
866 : $P_{30577} = (16, 26, 28, 1)$
867 : $P_{30647} = (22, 28, 28, 1)$
868 : $P_{30662} = (5, 29, 28, 1)$
869 : $P_{30672} = (15, 29, 28, 1)$

$870: P_{30734} = (13, 31, 28, 1)$
$871: P_{30747} = (26, 31, 28, 1)$
$872: P_{31012} = (3, 8, 29, 1)$
$873: P_{31026} = (17, 8, 29, 1)$
$874: P_{31058} = (17, 9, 29, 1)$
$875: P_{31071} = (30, 9, 29, 1)$
$876: P_{31160} = (23, 12, 29, 1)$
$877: P_{31167} = (30, 12, 29, 1)$
$878: P_{31212} = (11, 14, 29, 1)$
$879: P_{31230} = (29, 14, 29, 1)$
$880: P_{31270} = (5, 16, 29, 1)$
$881: P_{31272} = (7, 16, 29, 1)$
$882: P_{31376} = (15, 19, 29, 1)$
$883: P_{31466} = (9, 22, 29, 1)$
$884: P_{31472} = (15, 22, 29, 1)$
$885: P_{31536} = (15, 24, 29, 1)$
$886: P_{31551} = (30, 24, 29, 1)$
$887: P_{31666} = (17, 28, 29, 1)$
$888: P_{31676} = (27, 28, 29, 1)$
$889: P_{31704} = (23, 29, 29, 1)$
$890: P_{31751} = (6, 31, 29, 1)$
$891: P_{31759} = (14, 31, 29, 1)$
$892: P_{31811} = (2, 1, 30, 1)$
$893: P_{31838} = (29, 1, 30, 1)$
$894: P_{31845} = (4, 2, 30, 1)$
$895: P_{31869} = (28, 2, 30, 1)$
$896: P_{31914} = (9, 4, 30, 1)$
$897: P_{31936} = (31, 4, 30, 1)$
$898: P_{32016} = (15, 7, 30, 1)$
$899: P_{32031} = (30, 7, 30, 1)$
$900: P_{32066} = (1, 9, 30, 1)$
$901: P_{32086} = (21, 9, 30, 1)$
$902: P_{32105} = (8, 10, 30, 1)$
$903: P_{32124} = (27, 10, 30, 1)$
$904: P_{32147} = (18, 11, 30, 1)$
$905: P_{32160} = (31, 11, 30, 1)$
$906: P_{32213} = (20, 13, 30, 1)$
$907: P_{32216} = (23, 13, 30, 1)$
$908: P_{32264} = (7, 15, 30, 1)$
$909: P_{32286} = (29, 15, 30, 1)$
$910: P_{32299} = (10, 16, 30, 1)$
$911: P_{32318} = (29, 16, 30, 1)$
$912: P_{32343} = (22, 17, 30, 1)$
$913: P_{32352} = (31, 17, 30, 1)$
$914: P_{32375} = (22, 18, 30, 1)$
$915: P_{32377} = (24, 18, 30, 1)$
$916: P_{32434} = (17, 20, 30, 1)$
$917: P_{32455} = (6, 21, 30, 1)$
$918: P_{32473} = (24, 21, 30, 1)$
$919: P_{32514} = (1, 23, 30, 1)$
$920: P_{32519} = (6, 23, 30, 1)$
$921: P_{32550} = (5, 24, 30, 1)$
$922: P_{32570} = (25, 24, 30, 1)$
$923: P_{32601} = (24, 25, 30, 1)$
$924: P_{32603} = (26, 25, 30, 1)$
$925: P_{32679} = (6, 28, 30, 1)$
$926: P_{32686} = (13, 28, 30, 1)$
$927: P_{32708} = (3, 29, 30, 1)$
$928: P_{32727} = (22, 29, 30, 1)$
$929: P_{32755} = (18, 30, 30, 1)$
$930: P_{32842} = (9, 1, 31, 1)$
$931: P_{32856} = (23, 1, 31, 1)$
$932: P_{32866} = (1, 2, 31, 1)$
$933: P_{32892} = (27, 2, 31, 1)$
$934: P_{32906} = (9, 3, 31, 1)$
$935: P_{32909} = (12, 3, 31, 1)$
$936: P_{33069} = (12, 8, 31, 1)$
$937: P_{33071} = (14, 8, 31, 1)$
$938: P_{33100} = (11, 9, 31, 1)$
$939: P_{33111} = (22, 9, 31, 1)$
$940: P_{33127} = (6, 10, 31, 1)$
$941: P_{33152} = (31, 10, 31, 1)$
$942: P_{33180} = (27, 11, 31, 1)$
$943: P_{33182} = (29, 11, 31, 1)$
$944: P_{33453} = (12, 20, 31, 1)$
$945: P_{33465} = (24, 20, 31, 1)$
$946: P_{33490} = (17, 21, 31, 1)$
$947: P_{33499} = (26, 21, 31, 1)$
$948: P_{33525} = (20, 22, 31, 1)$
$949: P_{33532} = (27, 22, 31, 1)$
$950: P_{33545} = (8, 23, 31, 1)$
$951: P_{33561} = (24, 23, 31, 1)$
$952: P_{33684} = (19, 27, 31, 1)$
$953: P_{33712} = (15, 28, 31, 1)$
$954: P_{33721} = (24, 28, 31, 1)$
$955: P_{33730} = (1, 29, 31, 1)$
$956: P_{33738} = (9, 29, 31, 1)$
$957: P_{33777} = (16, 30, 31, 1)$
$958: P_{33789} = (28, 30, 31, 1)$
$959: P_{33812} = (19, 31, 31, 1)$

Line Intersection Graph

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

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2
in point	P_2	P_2

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3
in point	P_2	P_2	P_3

Line 2 intersects

Line	ℓ_0	ℓ_1
in point	P_2	P_2

Line 3 intersects

Line	ℓ_1
in point	P_3

The surface has 1089 points:
Too many to print.