

Rank-65869 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 1, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)

The point rank of the equation over GF(32) is -2112814011

General information

Number of lines	2
Number of points	1057
Number of singular points	2
Number of Eckardt points	0
Number of double points	1
Number of single points	64
Number of points off lines	992
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33^2
Type of lines on points	$2, 1^{64}, 0^{992}$

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 2 Lines

The lines and their Pluecker coordinates are:

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

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{34848} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{34848} = \mathbf{Pl}(0, 1, 1, 0, 0, 0)_{34}$$

Rank of lines: (1024, 34848)

Rank of points on Klein quadric: (2, 34)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 1 Double points:

The double points on the surface are:

$$P_2 = (0, 0, 1, 0) = \ell_0 \cap \ell_1$$

Single Points

The surface has 64 single points:

The single points on the surface are:

- | | |
|---|--|
| 0 : $P_0 = (1, 0, 0, 0)$ lies on line ℓ_0 | 29 : $P_{64} = (29, 0, 1, 0)$ lies on line ℓ_0 |
| 1 : $P_{36} = (1, 0, 1, 0)$ lies on line ℓ_0 | 30 : $P_{65} = (30, 0, 1, 0)$ lies on line ℓ_0 |
| 2 : $P_{37} = (2, 0, 1, 0)$ lies on line ℓ_0 | 31 : $P_{66} = (31, 0, 1, 0)$ lies on line ℓ_0 |
| 3 : $P_{38} = (3, 0, 1, 0)$ lies on line ℓ_0 | 32 : $P_{1059} = (1, 0, 0, 1)$ lies on line ℓ_1 |
| 4 : $P_{39} = (4, 0, 1, 0)$ lies on line ℓ_0 | 33 : $P_{2083} = (1, 0, 1, 1)$ lies on line ℓ_1 |
| 5 : $P_{40} = (5, 0, 1, 0)$ lies on line ℓ_0 | 34 : $P_{3106} = (1, 0, 2, 1)$ lies on line ℓ_1 |
| 6 : $P_{41} = (6, 0, 1, 0)$ lies on line ℓ_0 | 35 : $P_{4130} = (1, 0, 3, 1)$ lies on line ℓ_1 |
| 7 : $P_{42} = (7, 0, 1, 0)$ lies on line ℓ_0 | 36 : $P_{5154} = (1, 0, 4, 1)$ lies on line ℓ_1 |
| 8 : $P_{43} = (8, 0, 1, 0)$ lies on line ℓ_0 | 37 : $P_{6178} = (1, 0, 5, 1)$ lies on line ℓ_1 |
| 9 : $P_{44} = (9, 0, 1, 0)$ lies on line ℓ_0 | 38 : $P_{7202} = (1, 0, 6, 1)$ lies on line ℓ_1 |
| 10 : $P_{45} = (10, 0, 1, 0)$ lies on line ℓ_0 | 39 : $P_{8226} = (1, 0, 7, 1)$ lies on line ℓ_1 |
| 11 : $P_{46} = (11, 0, 1, 0)$ lies on line ℓ_0 | 40 : $P_{9250} = (1, 0, 8, 1)$ lies on line ℓ_1 |
| 12 : $P_{47} = (12, 0, 1, 0)$ lies on line ℓ_0 | 41 : $P_{10274} = (1, 0, 9, 1)$ lies on line ℓ_1 |
| 13 : $P_{48} = (13, 0, 1, 0)$ lies on line ℓ_0 | 42 : $P_{11298} = (1, 0, 10, 1)$ lies on line ℓ_1 |
| 14 : $P_{49} = (14, 0, 1, 0)$ lies on line ℓ_0 | 43 : $P_{12322} = (1, 0, 11, 1)$ lies on line ℓ_1 |
| 15 : $P_{50} = (15, 0, 1, 0)$ lies on line ℓ_0 | 44 : $P_{13346} = (1, 0, 12, 1)$ lies on line ℓ_1 |
| 16 : $P_{51} = (16, 0, 1, 0)$ lies on line ℓ_0 | 45 : $P_{14370} = (1, 0, 13, 1)$ lies on line ℓ_1 |
| 17 : $P_{52} = (17, 0, 1, 0)$ lies on line ℓ_0 | 46 : $P_{15394} = (1, 0, 14, 1)$ lies on line ℓ_1 |
| 18 : $P_{53} = (18, 0, 1, 0)$ lies on line ℓ_0 | 47 : $P_{16418} = (1, 0, 15, 1)$ lies on line ℓ_1 |
| 19 : $P_{54} = (19, 0, 1, 0)$ lies on line ℓ_0 | 48 : $P_{17442} = (1, 0, 16, 1)$ lies on line ℓ_1 |
| 20 : $P_{55} = (20, 0, 1, 0)$ lies on line ℓ_0 | 49 : $P_{18466} = (1, 0, 17, 1)$ lies on line ℓ_1 |
| 21 : $P_{56} = (21, 0, 1, 0)$ lies on line ℓ_0 | 50 : $P_{19490} = (1, 0, 18, 1)$ lies on line ℓ_1 |
| 22 : $P_{57} = (22, 0, 1, 0)$ lies on line ℓ_0 | 51 : $P_{20514} = (1, 0, 19, 1)$ lies on line ℓ_1 |
| 23 : $P_{58} = (23, 0, 1, 0)$ lies on line ℓ_0 | 52 : $P_{21538} = (1, 0, 20, 1)$ lies on line ℓ_1 |
| 24 : $P_{59} = (24, 0, 1, 0)$ lies on line ℓ_0 | 53 : $P_{22562} = (1, 0, 21, 1)$ lies on line ℓ_1 |
| 25 : $P_{60} = (25, 0, 1, 0)$ lies on line ℓ_0 | 54 : $P_{23586} = (1, 0, 22, 1)$ lies on line ℓ_1 |
| 26 : $P_{61} = (26, 0, 1, 0)$ lies on line ℓ_0 | 55 : $P_{24610} = (1, 0, 23, 1)$ lies on line ℓ_1 |
| 27 : $P_{62} = (27, 0, 1, 0)$ lies on line ℓ_0 | 56 : $P_{25634} = (1, 0, 24, 1)$ lies on line ℓ_1 |
| 28 : $P_{63} = (28, 0, 1, 0)$ lies on line ℓ_0 | 57 : $P_{26658} = (1, 0, 25, 1)$ lies on line ℓ_1 |

58 : $P_{27682} = (1, 0, 26, 1)$ lies on line ℓ_1
59 : $P_{28706} = (1, 0, 27, 1)$ lies on line ℓ_1
60 : $P_{29730} = (1, 0, 28, 1)$ lies on line ℓ_1
61 : $P_{30754} = (1, 0, 29, 1)$ lies on line ℓ_1

62 : $P_{31778} = (1, 0, 30, 1)$ lies on line ℓ_1
63 : $P_{32802} = (1, 0, 31, 1)$ 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 : $P_{67} = (0, 1, 1, 0)$	40 : $P_{1405} = (27, 10, 0, 1)$
1 : $P_{105} = (6, 2, 1, 0)$	41 : $P_{1434} = (24, 11, 0, 1)$
2 : $P_{137} = (6, 3, 1, 0)$	42 : $P_{1461} = (19, 12, 0, 1)$
3 : $P_{183} = (20, 4, 1, 0)$	43 : $P_{1489} = (15, 13, 0, 1)$
4 : $P_{215} = (20, 5, 1, 0)$	44 : $P_{1508} = (2, 14, 0, 1)$
5 : $P_{245} = (18, 6, 1, 0)$	45 : $P_{1545} = (7, 15, 0, 1)$
6 : $P_{277} = (18, 7, 1, 0)$	46 : $P_{1581} = (11, 16, 0, 1)$
7 : $P_{293} = (2, 8, 1, 0)$	47 : $P_{1632} = (30, 17, 0, 1)$
8 : $P_{325} = (2, 9, 1, 0)$	48 : $P_{1662} = (28, 18, 0, 1)$
9 : $P_{359} = (4, 10, 1, 0)$	49 : $P_{1682} = (16, 19, 0, 1)$
10 : $P_{391} = (4, 11, 1, 0)$	50 : $P_{1720} = (22, 20, 0, 1)$
11 : $P_{441} = (22, 12, 1, 0)$	51 : $P_{1735} = (5, 21, 0, 1)$
12 : $P_{473} = (22, 13, 1, 0)$	52 : $P_{1768} = (6, 22, 0, 1)$
13 : $P_{499} = (16, 14, 1, 0)$	53 : $P_{1806} = (12, 23, 0, 1)$
14 : $P_{531} = (16, 15, 1, 0)$	54 : $P_{1852} = (26, 24, 0, 1)$
15 : $P_{576} = (29, 16, 1, 0)$	55 : $P_{1878} = (20, 25, 0, 1)$
16 : $P_{608} = (29, 17, 1, 0)$	56 : $P_{1898} = (8, 26, 0, 1)$
17 : $P_{638} = (27, 18, 1, 0)$	57 : $P_{1953} = (31, 27, 0, 1)$
18 : $P_{670} = (27, 19, 1, 0)$	58 : $P_{1971} = (17, 28, 0, 1)$
19 : $P_{684} = (9, 20, 1, 0)$	59 : $P_{2011} = (25, 29, 0, 1)$
20 : $P_{716} = (9, 21, 1, 0)$	60 : $P_{2022} = (4, 30, 0, 1)$
21 : $P_{754} = (15, 22, 1, 0)$	61 : $P_{2071} = (21, 31, 0, 1)$
22 : $P_{786} = (15, 23, 1, 0)$	62 : $P_{2289} = (16, 6, 1, 1)$
23 : $P_{834} = (31, 24, 1, 0)$	63 : $P_{2295} = (22, 6, 1, 1)$
24 : $P_{866} = (31, 25, 1, 0)$	64 : $P_{2360} = (23, 8, 1, 1)$
25 : $P_{892} = (25, 26, 1, 0)$	65 : $P_{2368} = (31, 8, 1, 1)$
26 : $P_{924} = (25, 27, 1, 0)$	66 : $P_{2419} = (18, 10, 1, 1)$
27 : $P_{942} = (11, 28, 1, 0)$	67 : $P_{2425} = (24, 10, 1, 1)$
28 : $P_{974} = (11, 29, 1, 0)$	68 : $P_{2536} = (7, 14, 1, 1)$
29 : $P_{1008} = (13, 30, 1, 0)$	69 : $P_{2538} = (9, 14, 1, 1)$
30 : $P_{1040} = (13, 31, 1, 0)$	70 : $P_{2704} = (15, 19, 1, 1)$
31 : $P_{1090} = (0, 1, 0, 1)$	71 : $P_{2717} = (28, 19, 1, 1)$
32 : $P_{1140} = (18, 2, 0, 1)$	72 : $P_{2734} = (13, 20, 1, 1)$
33 : $P_{1164} = (10, 3, 0, 1)$	73 : $P_{2746} = (25, 20, 1, 1)$
34 : $P_{1195} = (9, 4, 0, 1)$	74 : $P_{2787} = (2, 22, 1, 1)$
35 : $P_{1232} = (14, 5, 0, 1)$	75 : $P_{2805} = (20, 22, 1, 1)$
36 : $P_{1279} = (29, 6, 0, 1)$	76 : $P_{2885} = (4, 25, 1, 1)$
37 : $P_{1285} = (3, 7, 0, 1)$	77 : $P_{2910} = (29, 25, 1, 1)$
38 : $P_{1327} = (13, 8, 0, 1)$	78 : $P_{3015} = (6, 29, 1, 1)$
39 : $P_{1369} = (23, 9, 0, 1)$	79 : $P_{3036} = (27, 29, 1, 1)$

80 : $P_{3052} = (11, 30, 1, 1)$	134 : $P_{5129} = (8, 31, 3, 1)$
81 : $P_{3062} = (21, 30, 1, 1)$	135 : $P_{5133} = (12, 31, 3, 1)$
82 : $P_{3149} = (12, 1, 2, 1)$	136 : $P_{5211} = (26, 1, 4, 1)$
83 : $P_{3151} = (14, 1, 2, 1)$	137 : $P_{5215} = (30, 1, 4, 1)$
84 : $P_{3196} = (27, 2, 2, 1)$	138 : $P_{5233} = (16, 2, 4, 1)$
85 : $P_{3200} = (31, 2, 2, 1)$	139 : $P_{5241} = (24, 2, 4, 1)$
86 : $P_{3318} = (21, 6, 2, 1)$	140 : $P_{5283} = (2, 4, 4, 1)$
87 : $P_{3322} = (25, 6, 2, 1)$	141 : $P_{5299} = (18, 4, 4, 1)$
88 : $P_{3370} = (9, 8, 2, 1)$	142 : $P_{5479} = (6, 10, 4, 1)$
89 : $P_{3386} = (25, 8, 2, 1)$	143 : $P_{5484} = (11, 10, 4, 1)$
90 : $P_{3401} = (8, 9, 2, 1)$	144 : $P_{5508} = (3, 11, 4, 1)$
91 : $P_{3419} = (26, 9, 2, 1)$	145 : $P_{5515} = (10, 11, 4, 1)$
92 : $P_{3490} = (1, 12, 2, 1)$	146 : $P_{5763} = (2, 19, 4, 1)$
93 : $P_{3514} = (25, 12, 2, 1)$	147 : $P_{5765} = (4, 19, 4, 1)$
94 : $P_{3526} = (5, 13, 2, 1)$	148 : $P_{5799} = (6, 20, 4, 1)$
95 : $P_{3552} = (31, 13, 2, 1)$	149 : $P_{5821} = (28, 20, 4, 1)$
96 : $P_{3554} = (1, 14, 2, 1)$	150 : $P_{5894} = (5, 23, 4, 1)$
97 : $P_{3582} = (29, 14, 2, 1)$	151 : $P_{5908} = (19, 23, 4, 1)$
98 : $P_{3973} = (4, 27, 2, 1)$	152 : $P_{5986} = (1, 26, 4, 1)$
99 : $P_{3992} = (23, 27, 2, 1)$	153 : $P_{5991} = (6, 26, 4, 1)$
100 : $P_{4004} = (3, 28, 2, 1)$	154 : $P_{6034} = (17, 27, 4, 1)$
101 : $P_{4031} = (30, 28, 2, 1)$	155 : $P_{6035} = (18, 27, 4, 1)$
102 : $P_{4067} = (2, 30, 2, 1)$	156 : $P_{6114} = (1, 30, 4, 1)$
103 : $P_{4092} = (27, 30, 2, 1)$	157 : $P_{6135} = (22, 30, 4, 1)$
104 : $P_{4210} = (17, 2, 3, 1)$	158 : $P_{6245} = (4, 2, 5, 1)$
105 : $P_{4216} = (23, 2, 3, 1)$	159 : $P_{6255} = (14, 2, 5, 1)$
106 : $P_{4274} = (17, 4, 3, 1)$	160 : $P_{6317} = (12, 4, 5, 1)$
107 : $P_{4286} = (29, 4, 3, 1)$	161 : $P_{6329} = (24, 4, 5, 1)$
108 : $P_{4306} = (17, 5, 3, 1)$	162 : $P_{6374} = (5, 6, 5, 1)$
109 : $P_{4319} = (30, 5, 3, 1)$	163 : $P_{6396} = (27, 6, 5, 1)$
110 : $P_{4371} = (18, 7, 3, 1)$	164 : $P_{6455} = (22, 8, 5, 1)$
111 : $P_{4380} = (27, 7, 3, 1)$	165 : $P_{6460} = (27, 8, 5, 1)$
112 : $P_{4395} = (10, 8, 3, 1)$	166 : $P_{6506} = (9, 10, 5, 1)$
113 : $P_{4403} = (18, 8, 3, 1)$	167 : $P_{6511} = (14, 10, 5, 1)$
114 : $P_{4430} = (13, 9, 3, 1)$	168 : $P_{6554} = (25, 11, 5, 1)$
115 : $P_{4439} = (22, 9, 3, 1)$	169 : $P_{6556} = (27, 11, 5, 1)$
116 : $P_{4519} = (6, 12, 3, 1)$	170 : $P_{6607} = (14, 13, 5, 1)$
117 : $P_{4531} = (18, 12, 3, 1)$	171 : $P_{6611} = (18, 13, 5, 1)$
118 : $P_{4651} = (10, 16, 3, 1)$	172 : $P_{6701} = (12, 16, 5, 1)$
119 : $P_{4672} = (31, 16, 3, 1)$	173 : $P_{6711} = (22, 16, 5, 1)$
120 : $P_{4750} = (13, 19, 3, 1)$	174 : $P_{6733} = (12, 17, 5, 1)$
121 : $P_{4766} = (29, 19, 3, 1)$	175 : $P_{6740} = (19, 17, 5, 1)$
122 : $P_{4773} = (4, 20, 3, 1)$	176 : $P_{6763} = (10, 18, 5, 1)$
123 : $P_{4798} = (29, 20, 3, 1)$	177 : $P_{6779} = (26, 18, 5, 1)$
124 : $P_{4932} = (3, 25, 3, 1)$	178 : $P_{6785} = (0, 19, 5, 1)$
125 : $P_{4942} = (13, 25, 3, 1)$	179 : $P_{6806} = (21, 19, 5, 1)$
126 : $P_{4995} = (2, 27, 3, 1)$	180 : $P_{6851} = (2, 21, 5, 1)$
127 : $P_{5003} = (10, 27, 3, 1)$	181 : $P_{6858} = (9, 21, 5, 1)$
128 : $P_{5039} = (14, 28, 3, 1)$	182 : $P_{6892} = (11, 22, 5, 1)$
129 : $P_{5040} = (15, 28, 3, 1)$	183 : $P_{6896} = (15, 22, 5, 1)$
130 : $P_{5066} = (9, 29, 3, 1)$	184 : $P_{6943} = (30, 23, 5, 1)$
131 : $P_{5068} = (11, 29, 3, 1)$	185 : $P_{6944} = (31, 23, 5, 1)$
132 : $P_{5089} = (0, 30, 3, 1)$	186 : $P_{7018} = (9, 26, 5, 1)$
133 : $P_{5096} = (7, 30, 3, 1)$	187 : $P_{7029} = (20, 26, 5, 1)$

188 : $P_{7121} = (16, 29, 5, 1)$
 189 : $P_{7127} = (22, 29, 5, 1)$
 190 : $P_{7268} = (3, 2, 6, 1)$
 191 : $P_{7280} = (15, 2, 6, 1)$
 192 : $P_{7299} = (2, 3, 6, 1)$
 193 : $P_{7305} = (8, 3, 6, 1)$
 194 : $P_{7472} = (15, 8, 6, 1)$
 195 : $P_{7483} = (26, 8, 6, 1)$
 196 : $P_{7491} = (2, 9, 6, 1)$
 197 : $P_{7506} = (17, 9, 6, 1)$
 198 : $P_{7526} = (5, 10, 6, 1)$
 199 : $P_{7549} = (28, 10, 6, 1)$
 200 : $P_{7553} = (0, 11, 6, 1)$
 201 : $P_{7584} = (31, 11, 6, 1)$
 202 : $P_{7587} = (2, 12, 6, 1)$
 203 : $P_{7600} = (15, 12, 6, 1)$
 204 : $P_{7691} = (10, 15, 6, 1)$
 205 : $P_{7694} = (13, 15, 6, 1)$
 206 : $P_{7748} = (3, 17, 6, 1)$
 207 : $P_{7755} = (10, 17, 6, 1)$
 208 : $P_{7797} = (20, 18, 6, 1)$
 209 : $P_{7800} = (23, 18, 6, 1)$
 210 : $P_{7876} = (3, 21, 6, 1)$
 211 : $P_{7891} = (18, 21, 6, 1)$
 212 : $P_{7919} = (14, 22, 6, 1)$
 213 : $P_{7926} = (21, 22, 6, 1)$
 214 : $P_{7937} = (0, 23, 6, 1)$
 215 : $P_{7966} = (29, 23, 6, 1)$
 216 : $P_{7979} = (10, 24, 6, 1)$
 217 : $P_{7985} = (16, 24, 6, 1)$
 218 : $P_{8033} = (0, 26, 6, 1)$
 219 : $P_{8055} = (22, 26, 6, 1)$
 220 : $P_{8073} = (8, 27, 6, 1)$
 221 : $P_{8089} = (24, 27, 6, 1)$
 222 : $P_{8122} = (25, 28, 6, 1)$
 223 : $P_{8124} = (27, 28, 6, 1)$
 224 : $P_{8167} = (6, 30, 6, 1)$
 225 : $P_{8169} = (8, 30, 6, 1)$
 226 : $P_{8295} = (6, 2, 7, 1)$
 227 : $P_{8297} = (8, 2, 7, 1)$
 228 : $P_{8518} = (5, 9, 7, 1)$
 229 : $P_{8544} = (31, 9, 7, 1)$
 230 : $P_{8619} = (10, 12, 7, 1)$
 231 : $P_{8620} = (11, 12, 7, 1)$
 232 : $P_{8676} = (3, 14, 7, 1)$
 233 : $P_{8685} = (12, 14, 7, 1)$
 234 : $P_{8745} = (8, 16, 7, 1)$
 235 : $P_{8760} = (23, 16, 7, 1)$
 236 : $P_{8782} = (13, 17, 7, 1)$
 237 : $P_{8790} = (21, 17, 7, 1)$
 238 : $P_{8808} = (7, 18, 7, 1)$
 239 : $P_{8823} = (22, 18, 7, 1)$
 240 : $P_{8865} = (0, 20, 7, 1)$
 241 : $P_{8868} = (3, 20, 7, 1)$

242 : $P_{8905} = (8, 21, 7, 1)$
 243 : $P_{8909} = (12, 21, 7, 1)$
 244 : $P_{8948} = (19, 22, 7, 1)$
 245 : $P_{8959} = (30, 22, 7, 1)$
 246 : $P_{9133} = (12, 28, 7, 1)$
 247 : $P_{9139} = (18, 28, 7, 1)$
 248 : $P_{9156} = (3, 29, 7, 1)$
 249 : $P_{9179} = (26, 29, 7, 1)$
 250 : $P_{9288} = (7, 1, 8, 1)$
 251 : $P_{9296} = (15, 1, 8, 1)$
 252 : $P_{9360} = (15, 3, 8, 1)$
 253 : $P_{9368} = (23, 3, 8, 1)$
 254 : $P_{9429} = (20, 5, 8, 1)$
 255 : $P_{9434} = (25, 5, 8, 1)$
 256 : $P_{9450} = (9, 6, 8, 1)$
 257 : $P_{9469} = (28, 6, 8, 1)$
 258 : $P_{9474} = (1, 7, 8, 1)$
 259 : $P_{9501} = (28, 7, 8, 1)$
 260 : $P_{9525} = (20, 8, 8, 1)$
 261 : $P_{9535} = (30, 8, 8, 1)$
 262 : $P_{9565} = (28, 9, 8, 1)$
 263 : $P_{9567} = (30, 9, 8, 1)$
 264 : $P_{9584} = (15, 10, 8, 1)$
 265 : $P_{9590} = (21, 10, 8, 1)$
 266 : $P_{9649} = (16, 12, 8, 1)$
 267 : $P_{9664} = (31, 12, 8, 1)$
 268 : $P_{9730} = (1, 15, 8, 1)$
 269 : $P_{9751} = (22, 15, 8, 1)$
 270 : $P_{9880} = (23, 19, 8, 1)$
 271 : $P_{9884} = (27, 19, 8, 1)$
 272 : $P_{9961} = (8, 22, 8, 1)$
 273 : $P_{9962} = (9, 22, 8, 1)$
 274 : $P_{10026} = (9, 24, 8, 1)$
 275 : $P_{10040} = (23, 24, 8, 1)$
 276 : $P_{10129} = (16, 27, 8, 1)$
 277 : $P_{10135} = (22, 27, 8, 1)$
 278 : $P_{10158} = (13, 28, 8, 1)$
 279 : $P_{10167} = (22, 28, 8, 1)$
 280 : $P_{10179} = (2, 29, 8, 1)$
 281 : $P_{10194} = (17, 29, 8, 1)$
 282 : $P_{10257} = (16, 31, 8, 1)$
 283 : $P_{10260} = (19, 31, 8, 1)$
 284 : $P_{10321} = (16, 1, 9, 1)$
 285 : $P_{10330} = (25, 1, 9, 1)$
 286 : $P_{10423} = (22, 4, 9, 1)$
 287 : $P_{10424} = (23, 4, 9, 1)$
 288 : $P_{10476} = (11, 6, 9, 1)$
 289 : $P_{10489} = (24, 6, 9, 1)$
 290 : $P_{10546} = (17, 8, 9, 1)$
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 697 : $P_{23892} = (19, 9, 22, 1)$
 698 : $P_{23927} = (22, 10, 22, 1)$
 699 : $P_{23935} = (30, 10, 22, 1)$
 700 : $P_{23982} = (13, 12, 22, 1)$
 701 : $P_{23999} = (30, 12, 22, 1)$
 702 : $P_{24010} = (9, 13, 22, 1)$
 703 : $P_{24013} = (12, 13, 22, 1)$
 704 : $P_{24086} = (21, 15, 22, 1)$
 705 : $P_{24090} = (25, 15, 22, 1)$
 706 : $P_{24125} = (28, 16, 22, 1)$
 707 : $P_{24127} = (30, 16, 22, 1)$
 708 : $P_{24129} = (0, 17, 22, 1)$
 709 : $P_{24149} = (20, 17, 22, 1)$
 710 : $P_{24161} = (0, 18, 22, 1)$
 711 : $P_{24172} = (11, 18, 22, 1)$
 712 : $P_{24200} = (7, 19, 22, 1)$
 713 : $P_{24219} = (26, 19, 22, 1)$
 714 : $P_{24233} = (8, 20, 22, 1)$
 715 : $P_{24249} = (24, 20, 22, 1)$
 716 : $P_{24257} = (0, 21, 22, 1)$
 717 : $P_{24263} = (6, 21, 22, 1)$
 718 : $P_{24365} = (12, 24, 22, 1)$
 719 : $P_{24368} = (15, 24, 22, 1)$
 720 : $P_{24483} = (2, 28, 22, 1)$
 721 : $P_{24500} = (19, 28, 22, 1)$
 722 : $P_{24554} = (9, 30, 22, 1)$
 723 : $P_{24562} = (17, 30, 22, 1)$
 724 : $P_{24580} = (3, 31, 22, 1)$
 725 : $P_{24590} = (13, 31, 22, 1)$
 726 : $P_{24694} = (21, 2, 23, 1)$
 727 : $P_{24703} = (30, 2, 23, 1)$

728 : $P_{24709} = (4, 3, 23, 1)$
 729 : $P_{24729} = (24, 3, 23, 1)$
 730 : $P_{24787} = (18, 5, 23, 1)$
 731 : $P_{24788} = (19, 5, 23, 1)$
 732 : $P_{24813} = (12, 6, 23, 1)$
 733 : $P_{24818} = (17, 6, 23, 1)$
 734 : $P_{24838} = (5, 7, 23, 1)$
 735 : $P_{24848} = (15, 7, 23, 1)$
 736 : $P_{24870} = (5, 8, 23, 1)$
 737 : $P_{24877} = (12, 8, 23, 1)$
 738 : $P_{25047} = (22, 13, 23, 1)$
 739 : $P_{25055} = (30, 13, 23, 1)$
 740 : $P_{25109} = (20, 15, 23, 1)$
 741 : $P_{25112} = (23, 15, 23, 1)$
 742 : $P_{25259} = (10, 20, 23, 1)$
 743 : $P_{25263} = (14, 20, 23, 1)$
 744 : $P_{25382} = (5, 24, 23, 1)$
 745 : $P_{25407} = (30, 24, 23, 1)$
 746 : $P_{25409} = (0, 25, 23, 1)$
 747 : $P_{25421} = (12, 25, 23, 1)$
 748 : $P_{25612} = (11, 31, 23, 1)$
 749 : $P_{25627} = (26, 31, 23, 1)$
 750 : $P_{25780} = (19, 4, 24, 1)$
 751 : $P_{25789} = (28, 4, 24, 1)$
 752 : $P_{25800} = (7, 5, 24, 1)$
 753 : $P_{25809} = (16, 5, 24, 1)$
 754 : $P_{25825} = (0, 6, 24, 1)$
 755 : $P_{25851} = (26, 6, 24, 1)$
 756 : $P_{25874} = (17, 7, 24, 1)$
 757 : $P_{25876} = (19, 7, 24, 1)$
 758 : $P_{25970} = (17, 10, 24, 1)$
 759 : $P_{25979} = (26, 10, 24, 1)$
 760 : $P_{26185} = (8, 17, 24, 1)$
 761 : $P_{26186} = (9, 17, 24, 1)$
 762 : $P_{26212} = (3, 18, 24, 1)$
 763 : $P_{26224} = (15, 18, 24, 1)$
 764 : $P_{26285} = (12, 20, 24, 1)$
 765 : $P_{26299} = (26, 20, 24, 1)$
 766 : $P_{26322} = (17, 21, 24, 1)$
 767 : $P_{26336} = (31, 21, 24, 1)$
 768 : $P_{26516} = (19, 27, 24, 1)$
 769 : $P_{26522} = (25, 27, 24, 1)$
 770 : $P_{26575} = (14, 29, 24, 1)$
 771 : $P_{26591} = (30, 29, 24, 1)$
 772 : $P_{26649} = (24, 31, 24, 1)$
 773 : $P_{26654} = (29, 31, 24, 1)$
 774 : $P_{26825} = (8, 5, 25, 1)$
 775 : $P_{26843} = (26, 5, 25, 1)$
 776 : $P_{26907} = (26, 7, 25, 1)$
 777 : $P_{26912} = (31, 7, 25, 1)$
 778 : $P_{26916} = (3, 8, 25, 1)$
 779 : $P_{26934} = (21, 8, 25, 1)$
 780 : $P_{26945} = (0, 9, 25, 1)$
 781 : $P_{26960} = (15, 9, 25, 1)$

782 : $P_{27017} = (8, 11, 25, 1)$
 783 : $P_{27025} = (16, 11, 25, 1)$
 784 : $P_{27041} = (0, 12, 25, 1)$
 785 : $P_{27070} = (29, 12, 25, 1)$
 786 : $P_{27092} = (19, 13, 25, 1)$
 787 : $P_{27096} = (23, 13, 25, 1)$
 788 : $P_{27124} = (19, 14, 25, 1)$
 789 : $P_{27130} = (25, 14, 25, 1)$
 790 : $P_{27212} = (11, 17, 25, 1)$
 791 : $P_{27228} = (27, 17, 25, 1)$
 792 : $P_{27238} = (5, 18, 25, 1)$
 793 : $P_{27260} = (27, 18, 25, 1)$
 794 : $P_{27276} = (11, 19, 25, 1)$
 795 : $P_{27277} = (12, 19, 25, 1)$
 796 : $P_{27342} = (13, 21, 25, 1)$
 797 : $P_{27351} = (22, 21, 25, 1)$
 798 : $P_{27397} = (4, 23, 25, 1)$
 799 : $P_{27401} = (8, 23, 25, 1)$
 800 : $P_{27508} = (19, 26, 25, 1)$
 801 : $P_{27516} = (27, 26, 25, 1)$
 802 : $P_{27532} = (11, 27, 25, 1)$
 803 : $P_{27547} = (26, 27, 25, 1)$
 804 : $P_{27553} = (0, 28, 25, 1)$
 805 : $P_{27573} = (20, 28, 25, 1)$
 806 : $P_{27592} = (7, 29, 25, 1)$
 807 : $P_{27595} = (10, 29, 25, 1)$
 808 : $P_{27655} = (6, 31, 25, 1)$
 809 : $P_{27677} = (28, 31, 25, 1)$
 810 : $P_{27750} = (5, 2, 26, 1)$
 811 : $P_{27765} = (20, 2, 26, 1)$
 812 : $P_{27782} = (5, 3, 26, 1)$
 813 : $P_{27791} = (14, 3, 26, 1)$
 814 : $P_{27817} = (8, 4, 26, 1)$
 815 : $P_{27824} = (15, 4, 26, 1)$
 816 : $P_{27875} = (2, 6, 26, 1)$
 817 : $P_{27893} = (20, 6, 26, 1)$
 818 : $P_{28105} = (8, 13, 26, 1)$
 819 : $P_{28124} = (27, 13, 26, 1)$
 820 : $P_{28129} = (0, 14, 26, 1)$
 821 : $P_{28153} = (24, 14, 26, 1)$
 822 : $P_{28178} = (17, 15, 26, 1)$
 823 : $P_{28180} = (19, 15, 26, 1)$
 824 : $P_{28250} = (25, 17, 26, 1)$
 825 : $P_{28256} = (31, 17, 26, 1)$
 826 : $P_{28273} = (16, 18, 26, 1)$
 827 : $P_{28286} = (29, 18, 26, 1)$
 828 : $P_{28297} = (8, 19, 26, 1)$
 829 : $P_{28320} = (31, 19, 26, 1)$
 830 : $P_{28330} = (9, 20, 26, 1)$
 831 : $P_{28339} = (18, 20, 26, 1)$
 832 : $P_{28363} = (10, 21, 26, 1)$
 833 : $P_{28364} = (11, 21, 26, 1)$
 834 : $P_{28401} = (16, 22, 26, 1)$
 835 : $P_{28411} = (26, 22, 26, 1)$

836 : $P_{28462} = (13, 24, 26, 1)$
 837 : $P_{28480} = (31, 24, 26, 1)$
 838 : $P_{28550} = (5, 27, 26, 1)$
 839 : $P_{28573} = (28, 27, 26, 1)$
 840 : $P_{28657} = (16, 30, 26, 1)$
 841 : $P_{28661} = (20, 30, 26, 1)$
 842 : $P_{28747} = (10, 1, 27, 1)$
 843 : $P_{28754} = (17, 1, 27, 1)$
 844 : $P_{29026} = (1, 10, 27, 1)$
 845 : $P_{29045} = (20, 10, 27, 1)$
 846 : $P_{29123} = (2, 13, 27, 1)$
 847 : $P_{29149} = (28, 13, 27, 1)$
 848 : $P_{29166} = (13, 14, 27, 1)$
 849 : $P_{29180} = (27, 14, 27, 1)$
 850 : $P_{29220} = (3, 16, 27, 1)$
 851 : $P_{29232} = (15, 16, 27, 1)$
 852 : $P_{29250} = (1, 17, 27, 1)$
 853 : $P_{29271} = (22, 17, 27, 1)$
 854 : $P_{29293} = (12, 18, 27, 1)$
 855 : $P_{29300} = (19, 18, 27, 1)$
 856 : $P_{29331} = (18, 19, 27, 1)$
 857 : $P_{29335} = (22, 19, 27, 1)$
 858 : $P_{29391} = (14, 21, 27, 1)$
 859 : $P_{29403} = (26, 21, 27, 1)$
 860 : $P_{29512} = (7, 25, 27, 1)$
 861 : $P_{29527} = (22, 25, 27, 1)$
 862 : $P_{29582} = (13, 27, 27, 1)$
 863 : $P_{29584} = (15, 27, 27, 1)$
 864 : $P_{29855} = (30, 3, 28, 1)$
 865 : $P_{29856} = (31, 3, 28, 1)$
 866 : $P_{29929} = (8, 6, 28, 1)$
 867 : $P_{29931} = (10, 6, 28, 1)$
 868 : $P_{30087} = (6, 11, 28, 1)$
 869 : $P_{30109} = (28, 11, 28, 1)$
 870 : $P_{30218} = (9, 15, 28, 1)$
 871 : $P_{30221} = (12, 15, 28, 1)$
 872 : $P_{30255} = (14, 16, 28, 1)$
 873 : $P_{30270} = (29, 16, 28, 1)$
 874 : $P_{30340} = (3, 19, 28, 1)$
 875 : $P_{30354} = (17, 19, 28, 1)$
 876 : $P_{30433} = (0, 22, 28, 1)$
 877 : $P_{30450} = (17, 22, 28, 1)$
 878 : $P_{30468} = (3, 23, 28, 1)$
 879 : $P_{30479} = (14, 23, 28, 1)$
 880 : $P_{30500} = (3, 24, 28, 1)$
 881 : $P_{30508} = (11, 24, 28, 1)$
 882 : $P_{30534} = (5, 25, 28, 1)$
 883 : $P_{30546} = (17, 25, 28, 1)$
 884 : $P_{30563} = (2, 26, 28, 1)$
 885 : $P_{30584} = (23, 26, 28, 1)$
 886 : $P_{30600} = (7, 27, 28, 1)$
 887 : $P_{30607} = (14, 27, 28, 1)$
 888 : $P_{30865} = (16, 3, 29, 1)$
 889 : $P_{30867} = (18, 3, 29, 1)$

890 : $P_{30895} = (14, 4, 29, 1)$
 891 : $P_{30902} = (21, 4, 29, 1)$
 892 : $P_{30913} = (0, 5, 29, 1)$
 893 : $P_{30919} = (6, 5, 29, 1)$
 894 : $P_{30964} = (19, 6, 29, 1)$
 895 : $P_{30968} = (23, 6, 29, 1)$
 896 : $P_{30977} = (0, 7, 29, 1)$
 897 : $P_{31002} = (25, 7, 29, 1)$
 898 : $P_{31023} = (14, 8, 29, 1)$
 899 : $P_{31038} = (29, 8, 29, 1)$
 900 : $P_{31112} = (7, 11, 29, 1)$
 901 : $P_{31127} = (22, 11, 29, 1)$
 902 : $P_{31206} = (5, 14, 29, 1)$
 903 : $P_{31219} = (18, 14, 29, 1)$
 904 : $P_{31249} = (16, 15, 29, 1)$
 905 : $P_{31259} = (26, 15, 29, 1)$
 906 : $P_{31282} = (17, 16, 29, 1)$
 907 : $P_{31283} = (18, 16, 29, 1)$
 908 : $P_{31311} = (14, 17, 29, 1)$
 909 : $P_{31313} = (16, 17, 29, 1)$
 910 : $P_{31331} = (2, 18, 29, 1)$
 911 : $P_{31359} = (30, 18, 29, 1)$
 912 : $P_{31452} = (27, 21, 29, 1)$
 913 : $P_{31455} = (30, 21, 29, 1)$
 914 : $P_{31500} = (11, 23, 29, 1)$
 915 : $P_{31506} = (17, 23, 29, 1)$
 916 : $P_{31525} = (4, 24, 29, 1)$
 917 : $P_{31541} = (20, 24, 29, 1)$
 918 : $P_{31602} = (17, 26, 29, 1)$
 919 : $P_{31615} = (30, 26, 29, 1)$
 920 : $P_{31725} = (12, 30, 29, 1)$
 921 : $P_{31737} = (24, 30, 29, 1)$
 922 : $P_{31745} = (0, 31, 29, 1)$
 923 : $P_{31754} = (9, 31, 29, 1)$
 924 : $P_{31818} = (9, 1, 30, 1)$
 925 : $P_{31832} = (23, 1, 30, 1)$
 926 : $P_{31939} = (2, 5, 30, 1)$
 927 : $P_{31948} = (11, 5, 30, 1)$
 928 : $P_{31972} = (3, 6, 30, 1)$
 929 : $P_{31982} = (13, 6, 30, 1)$
 930 : $P_{32005} = (4, 7, 30, 1)$
 931 : $P_{32021} = (20, 7, 30, 1)$
 932 : $P_{32066} = (1, 9, 30, 1)$
 933 : $P_{32085} = (20, 9, 30, 1)$
 934 : $P_{32131} = (2, 11, 30, 1)$
 935 : $P_{32143} = (14, 11, 30, 1)$
 936 : $P_{32170} = (9, 12, 30, 1)$
 937 : $P_{32182} = (21, 12, 30, 1)$
 938 : $P_{32241} = (16, 14, 30, 1)$
 939 : $P_{32246} = (21, 14, 30, 1)$
 940 : $P_{32291} = (2, 16, 30, 1)$
 941 : $P_{32309} = (20, 16, 30, 1)$
 942 : $P_{32394} = (9, 19, 30, 1)$
 943 : $P_{32409} = (24, 19, 30, 1)$

944 : $P_{32447} = (30, 20, 30, 1)$
 945 : $P_{32448} = (31, 20, 30, 1)$
 946 : $P_{32488} = (7, 22, 30, 1)$
 947 : $P_{32512} = (31, 22, 30, 1)$
 948 : $P_{32514} = (1, 23, 30, 1)$
 949 : $P_{32520} = (7, 23, 30, 1)$
 950 : $P_{32634} = (25, 26, 30, 1)$
 951 : $P_{32638} = (29, 26, 30, 1)$
 952 : $P_{32694} = (21, 28, 30, 1)$
 953 : $P_{32704} = (31, 28, 30, 1)$
 954 : $P_{32747} = (10, 30, 30, 1)$
 955 : $P_{32762} = (25, 30, 30, 1)$
 956 : $P_{32776} = (7, 31, 30, 1)$
 957 : $P_{32779} = (10, 31, 30, 1)$
 958 : $P_{32835} = (2, 1, 31, 1)$
 959 : $P_{32862} = (29, 1, 31, 1)$
 960 : $P_{32866} = (1, 2, 31, 1)$
 961 : $P_{32891} = (26, 2, 31, 1)$
 962 : $P_{32914} = (17, 3, 31, 1)$
 963 : $P_{32918} = (21, 3, 31, 1)$
 964 : $P_{32984} = (23, 5, 31, 1)$
 965 : $P_{32988} = (27, 5, 31, 1)$
 966 : $P_{33027} = (2, 7, 31, 1)$
 967 : $P_{33046} = (21, 7, 31, 1)$
 968 : $P_{33292} = (11, 15, 31, 1)$

969 : $P_{33312} = (31, 15, 31, 1)$
 970 : $P_{33313} = (0, 16, 31, 1)$
 971 : $P_{33319} = (6, 16, 31, 1)$
 972 : $P_{33350} = (5, 17, 31, 1)$
 973 : $P_{33373} = (28, 17, 31, 1)$
 974 : $P_{33381} = (4, 18, 31, 1)$
 975 : $P_{33402} = (25, 18, 31, 1)$
 976 : $P_{33492} = (19, 21, 31, 1)$
 977 : $P_{33498} = (25, 21, 31, 1)$
 978 : $P_{33523} = (18, 22, 31, 1)$
 979 : $P_{33533} = (28, 22, 31, 1)$
 980 : $P_{33594} = (25, 24, 31, 1)$
 981 : $P_{33597} = (28, 24, 31, 1)$
 982 : $P_{33603} = (2, 25, 31, 1)$
 983 : $P_{33625} = (24, 25, 31, 1)$
 984 : $P_{33685} = (20, 27, 31, 1)$
 985 : $P_{33686} = (21, 27, 31, 1)$
 986 : $P_{33730} = (1, 29, 31, 1)$
 987 : $P_{33737} = (8, 29, 31, 1)$
 988 : $P_{33764} = (3, 30, 31, 1)$
 989 : $P_{33775} = (14, 30, 31, 1)$
 990 : $P_{33798} = (5, 31, 31, 1)$
 991 : $P_{33816} = (23, 31, 31, 1)$

Line Intersection Graph

	0 1
0	0 1
1	1 0

Neighbor sets in the line intersection graph:

Line 0 intersects

Line	ℓ_1
in point	P_2

Line 1 intersects

Line	ℓ_0
in point	P_2

The surface has 1057 points:

Too many to print.