Rank-10566 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0)
The point rank of the equation over GF(32) is -2112846808

General information

Number of lines	15
Number of points	1185
Number of singular points	0
Number of Eckardt points	15
Number of double points	0
Number of single points	450
Number of points off lines	720
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33^{15}
Type of lines on points	$3^{15}, 1^{450}, 0^{720}$

Singular Points

The surface has 0 singular points:

The 15 Lines

The lines and their Pluecker coordinates are:

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

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 \end{bmatrix}_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 \end{bmatrix}_1 = \mathbf{Pl}(1,0,1,0,0,0)_3$$

$$\ell_2 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{1024} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{1024} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

$$\ell_3 = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082400} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082400} = \mathbf{Pl}(0,0,0,1,0,0)_{65}$$

$$\ell_4 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{33824} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{33824} = \mathbf{Pl}(1,0,0,1,0,0)_{66}$$

$$\ell_5 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1083424} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1083424} = \mathbf{Pl}(0,1,0,0,0,0)_1$$

$$\ell_6 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{34848} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{34848} = \mathbf{Pl}(0,1,1,0,0,0)_{34}$$

$$\ell_7 = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{2082} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{2082} = \mathbf{Pl}(0,0,1,1,1,1)_{70562}$$

$$\ell_8 = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{34914} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{34914} = \mathbf{Pl}(1,0,1,1,1,1)_{70563}$$

$$\ell_9 = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{1089} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{1089} = \mathbf{Pl}(1,1,0,0,1,1)_{68609}$$

$$\ell_{10} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{1090} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{1090} = \mathbf{Pl}(1,1,1,0,1,1)_{68640}$$

$$\ell_{11} = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082433} = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082433} = \mathbf{Pl}(0,1,0,1,0,0)_{97}$$

$$\ell_{12} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{33825} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{33825} = \mathbf{Pl}(1,1,1,1,0,0)_{128}$$

$$\ell_{13} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{34913} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{34913} = \mathbf{Pl}(1,1,0,1,1,1)_{69601}$$

$$\ell_{14} = \begin{bmatrix} 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{35906} = \begin{bmatrix} 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{35906} = \mathbf{Pl}(0,1,1,1,1,1)_{70594}$$

Rank of lines: (0, 1, 1024, 1082400, 33824, 1083424, 34848, 2082, 34914, 1089, 1090, 1082433, 33825, 34913, 35906)

Rank of points on Klein quadric: (0, 3, 2, 65, 66, 1, 34, 70562, 70563, 68609, 68640, 97, 128, 69601, 70594)

Eckardt Points

The surface has 15 Eckardt points:
$0 : P_0 = \mathbf{P}(1,0,0,0) = \mathbf{P}(1,0,0,0),$
$1 : P_1 = \mathbf{P}(0,1,0,0) = \mathbf{P}(0,1,0,0),$
$2 : P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0),$
$3 : P_3 = \mathbf{P}(0,0,0,1) = \mathbf{P}(0,0,0,1),$
$4 : P_4 = \mathbf{P}(1,1,1,1) = \mathbf{P}(1,1,1,1),$
$5 : P_5 = \mathbf{P}(1,1,0,0) = \mathbf{P}(1,1,0,0),$
$6 : P_{36} = \mathbf{P}(1,0,1,0) = \mathbf{P}(1,0,1,0),$
$7 : P_{67} = \mathbf{P}(0,1,1,0) = \mathbf{P}(0,1,1,0),$
$8 : P_{68} = \mathbf{P}(1,1,1,0) = \mathbf{P}(1,1,1,0),$
$9 : P_{1059} = \mathbf{P}(1,0,0,1) = \mathbf{P}(1,0,0,1),$
$10 : P_{1090} = \mathbf{P}(0,1,0,1) = \mathbf{P}(0,1,0,1),$
$11 : P_{1091} = \mathbf{P}(1,1,0,1) = \mathbf{P}(1,1,0,1),$
$12 : P_{2082} = \mathbf{P}(0,0,1,1) = \mathbf{P}(0,0,1,1),$
$13 : P_{2083} = \mathbf{P}(1,0,1,1) = \mathbf{P}(1,0,1,1),$
$14 : P_{2114} = \mathbf{P}(0,1,1,1) = \mathbf{P}(0,1,1,1).$

Double Points

The surface has 0 Double points:
The double points on the surface are:

Single Points

The surface has 450 single points:
The single points on the surface are:

$0 : P_6 = (2, 1, 0, 0)$ lies on line ℓ_0

$1 : P_7 = (3, 1, 0, 0)$ lies on line ℓ_0

$2 : P_8 = (4, 1, 0, 0)$ lies on line ℓ_0

$3 : P_9 = (5, 1, 0, 0)$ lies on line ℓ_0

$4 : P_{10} = (6, 1, 0, 0)$ lies on line ℓ_0

$5 : P_{11} = (7, 1, 0, 0)$ lies on line ℓ_0

$6 : P_{12} = (8, 1, 0, 0)$ lies on line ℓ_0

$7 : P_{13} = (9, 1, 0, 0)$ lies on line ℓ_0

$8 : P_{14} = (10, 1, 0, 0)$ lies on line ℓ_0

$9 : P_{15} = (11, 1, 0, 0)$ lies on line ℓ_0

$10 : P_{16} = (12, 1, 0, 0)$ lies on line ℓ_0

$11 : P_{17} = (13, 1, 0, 0)$ lies on line ℓ_0

$12 : P_{18} = (14, 1, 0, 0)$ lies on line ℓ_0

$13 : P_{19} = (15, 1, 0, 0)$ lies on line ℓ_0

$14 : P_{20} = (16, 1, 0, 0)$ lies on line ℓ_0

$15 : P_{21} = (17, 1, 0, 0)$ lies on line ℓ_0

$16 : P_{22} = (18, 1, 0, 0)$ lies on line ℓ_0

$17 : P_{23} = (19, 1, 0, 0)$ lies on line ℓ_0

$18 : P_{24} = (20, 1, 0, 0)$ lies on line ℓ_0

$19 : P_{25} = (21, 1, 0, 0)$ lies on line ℓ_0

$20 : P_{26} = (22, 1, 0, 0)$ lies on line ℓ_0

$21 : P_{27} = (23, 1, 0, 0)$ lies on line ℓ_0

$22 : P_{28} = (24, 1, 0, 0)$ lies on line ℓ_0

$23 : P_{29} = (25, 1, 0, 0)$ lies on line ℓ_0

$24 : P_{30} = (26, 1, 0, 0)$ lies on line ℓ_0

$25 : P_{31} = (27, 1, 0, 0)$ lies on line ℓ_0

$26 : P_{32} = (28, 1, 0, 0)$ lies on line ℓ_0

$27 : P_{33} = (29, 1, 0, 0)$ lies on line ℓ_0

$28 : P_{34} = (30, 1, 0, 0)$ lies on line ℓ_0

$29 : P_{35} = (31, 1, 0, 0)$ lies on line ℓ_0

$30 : P_{37} = (2, 0, 1, 0)$ lies on line ℓ_2

$31 : P_{38} = (3, 0, 1, 0)$ lies on line ℓ_2

$32 : P_{39} = (4, 0, 1, 0)$ lies on line ℓ_2

$33 : P_{40} = (5, 0, 1, 0)$ lies on line ℓ_2

$34 : P_{41} = (6, 0, 1, 0)$ lies on line ℓ_2

$35 : P_{42} = (7, 0, 1, 0)$ lies on line ℓ_2

$36 : P_{43} = (8, 0, 1, 0)$ lies on line ℓ_2

$37 : P_{44} = (9, 0, 1, 0)$ lies on line ℓ_2

$38 : P_{45} = (10, 0, 1, 0)$ lies on line ℓ_2

$39 : P_{46} = (11, 0, 1, 0)$ lies on line ℓ_2

$40 : P_{47} = (12, 0, 1, 0)$ lies on line ℓ_2

$41 : P_{48} = (13, 0, 1, 0)$ lies on line ℓ_2

$42 : P_{49} = (14, 0, 1, 0)$ lies on line ℓ_2

$43 : P_{50} = (15, 0, 1, 0)$ lies on line ℓ_2

$44 : P_{51} = (16, 0, 1, 0)$ lies on line ℓ_2

$45 : P_{52} = (17, 0, 1, 0)$ lies on line ℓ_2

$46 : P_{53} = (18, 0, 1, 0)$ lies on line ℓ_2

$47 : P_{54} = (19, 0, 1, 0)$ lies on line ℓ_2

$48 : P_{55} = (20, 0, 1, 0)$ lies on line ℓ_2

$49 : P_{56} = (21, 0, 1, 0)$ lies on line ℓ_2

$50 : P_{57} = (22, 0, 1, 0)$ lies on line ℓ_2

$51 : P_{58} = (23, 0, 1, 0)$ lies on line ℓ_2

$52 : P_{59} = (24, 0, 1, 0)$ lies on line ℓ_2

$53 : P_{60} = (25, 0, 1, 0)$ lies on line ℓ_2

$54 : P_{61} = (26, 0, 1, 0)$ lies on line ℓ_2

$55 : P_{62} = (27, 0, 1, 0)$ lies on line ℓ_2

$56 : P_{63} = (28, 0, 1, 0)$ lies on line ℓ_2

$57 : P_{64} = (29, 0, 1, 0)$ lies on line ℓ_2

$58 : P_{65} = (30, 0, 1, 0)$ lies on line ℓ_2

$59 : P_{66} = (31, 0, 1, 0)$ lies on line ℓ_2

$60 : P_{69} = (2, 1, 1, 0)$ lies on line ℓ_1

$61 : P_{70} = (3, 1, 1, 0)$ lies on line ℓ_1

$62 : P_{71} = (4, 1, 1, 0)$ lies on line ℓ_1

$63 : P_{72} = (5, 1, 1, 0)$ lies on line ℓ_1

$64 : P_{73} = (6, 1, 1, 0)$ lies on line ℓ_1

$65 : P_{74} = (7, 1, 1, 0)$ lies on line ℓ_1

$66 : P_{75} = (8, 1, 1, 0)$ lies on line ℓ_1

$67 : P_{76} = (9, 1, 1, 0)$ lies on line ℓ_1

$68 : P_{77} = (10, 1, 1, 0)$ lies on line ℓ_1

$69 : P_{78} = (11, 1, 1, 0)$ lies on line ℓ_1

$70 : P_{79} = (12, 1, 1, 0)$ lies on line ℓ_1

$71 : P_{80} = (13, 1, 1, 0)$ lies on line ℓ_1

$72 : P_{81} = (14, 1, 1, 0)$ lies on line ℓ_1

$73 : P_{82} = (15, 1, 1, 0)$ lies on line ℓ_1

$74 : P_{83} = (16, 1, 1, 0)$ lies on line ℓ_1

$75 : P_{84} = (17, 1, 1, 0)$ lies on line ℓ_1

$76 : P_{85} = (18, 1, 1, 0)$ lies on line ℓ_1

$77 : P_{86} = (19, 1, 1, 0)$ lies on line ℓ_1

$78 : P_{87} = (20, 1, 1, 0)$ lies on line ℓ_1

$79 : P_{88} = (21, 1, 1, 0)$ lies on line ℓ_1

$80 : P_{89} = (22, 1, 1, 0)$ lies on line ℓ_1

$81 : P_{90} = (23, 1, 1, 0)$ lies on line ℓ_1

$82 : P_{91} = (24, 1, 1, 0)$ lies on line ℓ_1

$83 : P_{92} = (25, 1, 1, 0)$ lies on line ℓ_1

$84 : P_{93} = (26, 1, 1, 0)$ lies on line ℓ_1

$85 : P_{94} = (27, 1, 1, 0)$ lies on line ℓ_1

$86 : P_{95} = (28, 1, 1, 0)$ lies on line ℓ_1

$87 : P_{96} = (29, 1, 1, 0)$ lies on line ℓ_1

$88 : P_{97} = (30, 1, 1, 0)$ lies on line ℓ_1

$89 : P_{98} = (31, 1, 1, 0)$ lies on line ℓ_1

$90 : P_{1122} = (0, 2, 0, 1)$ lies on line ℓ_3

$91 : P_{1123} = (1, 2, 0, 1)$ lies on line ℓ_4

$92 : P_{1154} = (0, 3, 0, 1)$ lies on line ℓ_3

$93 : P_{1155} = (1, 3, 0, 1)$ lies on line ℓ_4

$94 : P_{1186} = (0, 4, 0, 1)$ lies on line ℓ_3

$95 : P_{1187} = (1, 4, 0, 1)$ lies on line ℓ_4

$96 : P_{1218} = (0, 5, 0, 1)$ lies on line ℓ_3

$97 : P_{1219} = (1, 5, 0, 1)$ lies on line ℓ_4

$98 : P_{1250} = (0, 6, 0, 1)$ lies on line ℓ_3

$99 : P_{1251} = (1, 6, 0, 1)$ lies on line ℓ_4

$100 : P_{1282} = (0, 7, 0, 1)$ lies on line ℓ_3

$101 : P_{1283} = (1, 7, 0, 1)$ lies on line ℓ_4

$102 : P_{1314} = (0, 8, 0, 1)$ lies on line ℓ_3

$103 : P_{1315} = (1, 8, 0, 1)$ lies on line ℓ_4

$104 : P_{1346} = (0, 9, 0, 1)$ lies on line ℓ_3

$105 : P_{1347} = (1, 9, 0, 1)$ lies on line ℓ_4

$106 : P_{1378} = (0, 10, 0, 1)$ lies on line ℓ_3

$107 : P_{1379} = (1, 10, 0, 1)$ lies on line ℓ_4

$108 : P_{1410} = (0, 11, 0, 1)$ lies on line ℓ_3

$109 : P_{1411} = (1, 11, 0, 1)$ lies on line ℓ_4

$110 : P_{1442} = (0, 12, 0, 1)$ lies on line ℓ_3

$111 : P_{1443} = (1, 12, 0, 1)$ lies on line ℓ_4

$112 : P_{1474} = (0, 13, 0, 1)$ lies on line ℓ_3

$113 : P_{1475} = (1, 13, 0, 1)$ lies on line ℓ_4

$114 : P_{1506} = (0, 14, 0, 1)$ lies on line ℓ_3

$115 : P_{1507} = (1, 14, 0, 1)$ lies on line ℓ_4

$116 : P_{1538} = (0, 15, 0, 1)$ lies on line ℓ_3

$117 : P_{1539} = (1, 15, 0, 1)$ lies on line ℓ_4

$118 : P_{1570} = (0, 16, 0, 1)$ lies on line ℓ_3

$119 : P_{1571} = (1, 16, 0, 1)$ lies on line ℓ_4

$120 : P_{1602} = (0, 17, 0, 1)$ lies on line ℓ_3

$121 : P_{1603} = (1, 17, 0, 1)$ lies on line ℓ_4

$122 : P_{1634} = (0, 18, 0, 1)$ lies on line ℓ_3

$123 : P_{1635} = (1, 18, 0, 1)$ lies on line ℓ_4

$124 : P_{1666} = (0, 19, 0, 1)$ lies on line ℓ_3

$125 : P_{1667} = (1, 19, 0, 1)$ lies on line ℓ_4

$126 : P_{1698} = (0, 20, 0, 1)$ lies on line ℓ_3

$127 : P_{1699} = (1, 20, 0, 1)$ lies on line ℓ_4

$128 : P_{1730} = (0, 21, 0, 1)$ lies on line ℓ_3

$129 : P_{1731} = (1, 21, 0, 1)$ lies on line ℓ_4

$130 : P_{1762} = (0, 22, 0, 1)$ lies on line ℓ_3

$131 : P_{1763} = (1, 22, 0, 1)$ lies on line ℓ_4

$132 : P_{1794} = (0, 23, 0, 1)$ lies on line ℓ_3

$133 : P_{1795} = (1, 23, 0, 1)$ lies on line ℓ_4

$134 : P_{1826} = (0, 24, 0, 1)$ lies on line ℓ_3

$135 : P_{1827} = (1, 24, 0, 1)$ lies on line ℓ_4

$136 : P_{1858} = (0, 25, 0, 1)$ lies on line ℓ_3

$137 : P_{1859} = (1, 25, 0, 1)$ lies on line ℓ_4

$138 : P_{1890} = (0, 26, 0, 1)$ lies on line ℓ_3

$139 : P_{1891} = (1, 26, 0, 1)$ lies on line ℓ_4

$140 : P_{1922} = (0, 27, 0, 1)$ lies on line ℓ_3

$141 : P_{1923} = (1, 27, 0, 1)$ lies on line ℓ_4

$142 : P_{1954} = (0, 28, 0, 1)$ lies on line ℓ_3

$143 : P_{1955} = (1, 28, 0, 1)$ lies on line ℓ_4

$144 : P_{1986} = (0, 29, 0, 1)$ lies on line ℓ_3

$145 : P_{1987} = (1, 29, 0, 1)$ lies on line ℓ_4

$146 : P_{2018} = (0, 30, 0, 1)$ lies on line ℓ_3

$147 : P_{2019} = (1, 30, 0, 1)$ lies on line ℓ_4

$148 : P_{2050} = (0, 31, 0, 1)$ lies on line ℓ_3

$149 : P_{2051} = (1, 31, 0, 1)$ lies on line ℓ_4

$150 : P_{2147} = (2, 2, 1, 1)$ lies on line ℓ_7

$151 : P_{2148} = (3, 2, 1, 1)$ lies on line ℓ_8

$152 : P_{2179} = (2, 3, 1, 1)$ lies on line ℓ_8

$153 : P_{2180} = (3, 3, 1, 1)$ lies on line ℓ_7

$154 : P_{2213} = (4, 4, 1, 1)$ lies on line ℓ_7

$155 : P_{2214} = (5, 4, 1, 1)$ lies on line ℓ_8

$156 : P_{2245} = (4, 5, 1, 1)$ lies on line ℓ_8

$157 : P_{2246} = (5, 5, 1, 1)$ lies on line ℓ_7

$158 : P_{2279} = (6, 6, 1, 1)$ lies on line ℓ_7

$159 : P_{2280} = (7, 6, 1, 1)$ lies on line ℓ_8

$160 : P_{2311} = (6, 7, 1, 1)$ lies on line ℓ_8

$161 : P_{2312} = (7, 7, 1, 1)$ lies on line ℓ_7

$162 : P_{2345} = (8, 8, 1, 1)$ lies on line ℓ_7

$163 : P_{2346} = (9, 8, 1, 1)$ lies on line ℓ_8

$164 : P_{2377} = (8, 9, 1, 1)$ lies on line ℓ_8

$165 : P_{2378} = (9, 9, 1, 1)$ lies on line ℓ_7

$166 : P_{2411} = (10, 10, 1, 1)$ lies on line ℓ_7

$167 : P_{2412} = (11, 10, 1, 1)$ lies on line ℓ_8

$168 : P_{2443} = (10, 11, 1, 1)$ lies on line ℓ_8

$169 : P_{2444} = (11, 11, 1, 1)$ lies on line ℓ_7

$170 : P_{2477} = (12, 12, 1, 1)$ lies on line ℓ_7

$171 : P_{2478} = (13, 12, 1, 1)$ lies on line ℓ_8

$172 : P_{2509} = (12, 13, 1, 1)$ lies on line ℓ_8

$173 : P_{2510} = (13, 13, 1, 1)$ lies on line ℓ_7

$174 : P_{2543} = (14, 14, 1, 1)$ lies on line ℓ_7

$175 : P_{2544} = (15, 14, 1, 1)$ lies on line ℓ_8

$176 : P_{2575} = (14, 15, 1, 1)$ lies on line ℓ_8

$177 : P_{2576} = (15, 15, 1, 1)$ lies on line ℓ_7

$178 : P_{2609} = (16, 16, 1, 1)$ lies on line ℓ_7

$179 : P_{2610} = (17, 16, 1, 1)$ lies on line ℓ_8

$180 : P_{2641} = (16, 17, 1, 1)$ lies on line ℓ_8

$181 : P_{2642} = (17, 17, 1, 1)$ lies on line ℓ_7

$182 : P_{2675} = (18, 18, 1, 1)$ lies on line ℓ_7

$183 : P_{2676} = (19, 18, 1, 1)$ lies on line ℓ_8

$184 : P_{2707} = (18, 19, 1, 1)$ lies on line ℓ_8

$185 : P_{2708} = (19, 19, 1, 1)$ lies on line ℓ_7

$186 : P_{2741} = (20, 20, 1, 1)$ lies on line ℓ_7

$187 : P_{2742} = (21, 20, 1, 1)$ lies on line ℓ_8

$188 : P_{2773} = (20, 21, 1, 1)$ lies on line ℓ_8

$189 : P_{2774} = (21, 21, 1, 1)$ lies on line ℓ_7

$190 : P_{2807} = (22, 22, 1, 1)$ lies on line ℓ_7
$191 : P_{2808} = (23, 22, 1, 1)$ lies on line ℓ_8
$192 : P_{2839} = (22, 23, 1, 1)$ lies on line ℓ_8
$193 : P_{2840} = (23, 23, 1, 1)$ lies on line ℓ_7
$194 : P_{2873} = (24, 24, 1, 1)$ lies on line ℓ_7
$195 : P_{2874} = (25, 24, 1, 1)$ lies on line ℓ_8
$196 : P_{2905} = (24, 25, 1, 1)$ lies on line ℓ_8
$197 : P_{2906} = (25, 25, 1, 1)$ lies on line ℓ_7
$198 : P_{2939} = (26, 26, 1, 1)$ lies on line ℓ_7
$199 : P_{2940} = (27, 26, 1, 1)$ lies on line ℓ_8
$200 : P_{2971} = (26, 27, 1, 1)$ lies on line ℓ_8
$201 : P_{2972} = (27, 27, 1, 1)$ lies on line ℓ_7
$202 : P_{3005} = (28, 28, 1, 1)$ lies on line ℓ_7
$203 : P_{3006} = (29, 28, 1, 1)$ lies on line ℓ_8
$204 : P_{3037} = (28, 29, 1, 1)$ lies on line ℓ_8
$205 : P_{3038} = (29, 29, 1, 1)$ lies on line ℓ_7
$206 : P_{3071} = (30, 30, 1, 1)$ lies on line ℓ_7
$207 : P_{3072} = (31, 30, 1, 1)$ lies on line ℓ_8
$208 : P_{3103} = (30, 31, 1, 1)$ lies on line ℓ_8
$209 : P_{3104} = (31, 31, 1, 1)$ lies on line ℓ_7
$210 : P_{3105} = (0, 0, 2, 1)$ lies on line ℓ_5
$211 : P_{3106} = (1, 0, 2, 1)$ lies on line ℓ_6
$212 : P_{3139} = (2, 1, 2, 1)$ lies on line ℓ_9
$213 : P_{3140} = (3, 1, 2, 1)$ lies on line ℓ_{10}
$214 : P_{3169} = (0, 2, 2, 1)$ lies on line ℓ_{11}
$215 : P_{3170} = (1, 2, 2, 1)$ lies on line ℓ_{12}
$216 : P_{3203} = (2, 3, 2, 1)$ lies on line ℓ_{13}
$217 : P_{3204} = (3, 3, 2, 1)$ lies on line ℓ_{14}
$218 : P_{4129} = (0, 0, 3, 1)$ lies on line ℓ_5
$219 : P_{4130} = (1, 0, 3, 1)$ lies on line ℓ_6
$220 : P_{4163} = (2, 1, 3, 1)$ lies on line ℓ_{10}
$221 : P_{4164} = (3, 1, 3, 1)$ lies on line ℓ_9
$222 : P_{4195} = (2, 2, 3, 1)$ lies on line ℓ_{14}
$223 : P_{4196} = (3, 2, 3, 1)$ lies on line ℓ_{13}
$224 : P_{4225} = (0, 3, 3, 1)$ lies on line ℓ_{11}
$225 : P_{4226} = (1, 3, 3, 1)$ lies on line ℓ_{12}
$226 : P_{5153} = (0, 0, 4, 1)$ lies on line ℓ_5
$227 : P_{5154} = (1, 0, 4, 1)$ lies on line ℓ_6
$228 : P_{5189} = (4, 1, 4, 1)$ lies on line ℓ_9
$229 : P_{5190} = (5, 1, 4, 1)$ lies on line ℓ_{10}
$230 : P_{5281} = (0, 4, 4, 1)$ lies on line ℓ_{11}
$231 : P_{5282} = (1, 4, 4, 1)$ lies on line ℓ_{12}
$232 : P_{5317} = (4, 5, 4, 1)$ lies on line ℓ_{13}
$233 : P_{5318} = (5, 5, 4, 1)$ lies on line ℓ_{14}
$234 : P_{6177} = (0, 0, 5, 1)$ lies on line ℓ_5
$235 : P_{6178} = (1, 0, 5, 1)$ lies on line ℓ_6
$236 : P_{6213} = (4, 1, 5, 1)$ lies on line ℓ_{10}
$237 : P_{6214} = (5, 1, 5, 1)$ lies on line ℓ_9
$238 : P_{6309} = (4, 4, 5, 1)$ lies on line ℓ_{14}
$239 : P_{6310} = (5, 4, 5, 1)$ lies on line ℓ_{13}
$240 : P_{6337} = (0, 5, 5, 1)$ lies on line ℓ_{11}
$241 : P_{6338} = (1, 5, 5, 1)$ lies on line ℓ_{12}
$242 : P_{7201} = (0, 0, 6, 1)$ lies on line ℓ_5
$243 : P_{7202} = (1, 0, 6, 1)$ lies on line ℓ_6

$244 : P_{7239} = (6, 1, 6, 1)$ lies on line ℓ_9
$245 : P_{7240} = (7, 1, 6, 1)$ lies on line ℓ_{10}
$246 : P_{7393} = (0, 6, 6, 1)$ lies on line ℓ_{11}
$247 : P_{7394} = (1, 6, 6, 1)$ lies on line ℓ_{12}
$248 : P_{7431} = (6, 7, 6, 1)$ lies on line ℓ_{13}
$249 : P_{7432} = (7, 7, 6, 1)$ lies on line ℓ_{14}
$250 : P_{8225} = (0, 0, 7, 1)$ lies on line ℓ_5
$251 : P_{8226} = (1, 0, 7, 1)$ lies on line ℓ_6
$252 : P_{8263} = (6, 1, 7, 1)$ lies on line ℓ_{10}
$253 : P_{8264} = (7, 1, 7, 1)$ lies on line ℓ_9
$254 : P_{8423} = (6, 6, 7, 1)$ lies on line ℓ_{14}
$255 : P_{8424} = (7, 6, 7, 1)$ lies on line ℓ_{13}
$256 : P_{8449} = (0, 7, 7, 1)$ lies on line ℓ_{11}
$257 : P_{8450} = (1, 7, 7, 1)$ lies on line ℓ_{12}
$258 : P_{9249} = (0, 0, 8, 1)$ lies on line ℓ_5
$259 : P_{9250} = (1, 0, 8, 1)$ lies on line ℓ_6
$260 : P_{9289} = (8, 1, 8, 1)$ lies on line ℓ_9
$261 : P_{9290} = (9, 1, 8, 1)$ lies on line ℓ_{10}
$262 : P_{9505} = (0, 8, 8, 1)$ lies on line ℓ_{11}
$263 : P_{9506} = (1, 8, 8, 1)$ lies on line ℓ_{12}
$264 : P_{9545} = (8, 9, 8, 1)$ lies on line ℓ_{13}
$265 : P_{9546} = (9, 9, 8, 1)$ lies on line ℓ_{14}
$266 : P_{10273} = (0, 0, 9, 1)$ lies on line ℓ_5
$267 : P_{10274} = (1, 0, 9, 1)$ lies on line ℓ_6
$268 : P_{10313} = (8, 1, 9, 1)$ lies on line ℓ_{10}
$269 : P_{10314} = (9, 1, 9, 1)$ lies on line ℓ_9
$270 : P_{10537} = (8, 8, 9, 1)$ lies on line ℓ_{14}
$271 : P_{10538} = (9, 8, 9, 1)$ lies on line ℓ_{13}
$272 : P_{10561} = (0, 9, 9, 1)$ lies on line ℓ_{11}
$273 : P_{10562} = (1, 9, 9, 1)$ lies on line ℓ_{12}
$274 : P_{11297} = (0, 0, 10, 1)$ lies on line ℓ_5
$275 : P_{11298} = (1, 0, 10, 1)$ lies on line ℓ_6
$276 : P_{11339} = (10, 1, 10, 1)$ lies on line ℓ_9
$277 : P_{11340} = (11, 1, 10, 1)$ lies on line ℓ_{10}
$278 : P_{11617} = (0, 10, 10, 1)$ lies on line ℓ_{11}
$279 : P_{11618} = (1, 10, 10, 1)$ lies on line ℓ_{12}
$280 : P_{11659} = (10, 11, 10, 1)$ lies on line ℓ_{13}
$281 : P_{11660} = (11, 11, 10, 1)$ lies on line ℓ_{14}
$282 : P_{12321} = (0, 0, 11, 1)$ lies on line ℓ_5
$283 : P_{12322} = (1, 0, 11, 1)$ lies on line ℓ_6
$284 : P_{12363} = (10, 1, 11, 1)$ lies on line ℓ_{10}
$285 : P_{12364} = (11, 1, 11, 1)$ lies on line ℓ_9
$286 : P_{12651} = (10, 10, 11, 1)$ lies on line ℓ_{14}
$287 : P_{12652} = (11, 10, 11, 1)$ lies on line ℓ_{13}
$288 : P_{12673} = (0, 11, 11, 1)$ lies on line ℓ_{11}
$289 : P_{12674} = (1, 11, 11, 1)$ lies on line ℓ_{12}
$290 : P_{13345} = (0, 0, 12, 1)$ lies on line ℓ_5
$291 : P_{13346} = (1, 0, 12, 1)$ lies on line ℓ_6
$292 : P_{13389} = (12, 1, 12, 1)$ lies on line ℓ_9
$293 : P_{13390} = (13, 1, 12, 1)$ lies on line ℓ_{10}
$294 : P_{13729} = (0, 12, 12, 1)$ lies on line ℓ_{11}
$295 : P_{13730} = (1, 12, 12, 1)$ lies on line ℓ_{12}
$296 : P_{13773} = (12, 13, 12, 1)$ lies on line ℓ_{13}
$297 : P_{13774} = (13, 13, 12, 1)$ lies on line ℓ_{14}

$298: P_{14369} = (0, 0, 13, 1)$ lies on line ℓ_5

$299: P_{14370} = (1, 0, 13, 1)$ lies on line ℓ_6

$300: P_{14413} = (12, 1, 13, 1)$ lies on line ℓ_{10}

$301: P_{14414} = (13, 1, 13, 1)$ lies on line ℓ_9

$302: P_{14765} = (12, 12, 13, 1)$ lies on line ℓ_{14}

$303: P_{14766} = (13, 12, 13, 1)$ lies on line ℓ_{13}

$304: P_{14785} = (0, 13, 13, 1)$ lies on line ℓ_{11}

$305: P_{14786} = (1, 13, 13, 1)$ lies on line ℓ_{12}

$306: P_{15393} = (0, 0, 14, 1)$ lies on line ℓ_5

$307: P_{15394} = (1, 0, 14, 1)$ lies on line ℓ_6

$308: P_{15439} = (14, 1, 14, 1)$ lies on line ℓ_9

$309: P_{15440} = (15, 1, 14, 1)$ lies on line ℓ_{10}

$310: P_{15841} = (0, 14, 14, 1)$ lies on line ℓ_{11}

$311: P_{15842} = (1, 14, 14, 1)$ lies on line ℓ_{12}

$312: P_{15887} = (14, 15, 14, 1)$ lies on line ℓ_{13}

$313: P_{15888} = (15, 15, 14, 1)$ lies on line ℓ_{14}

$314: P_{16417} = (0, 0, 15, 1)$ lies on line ℓ_5

$315: P_{16418} = (1, 0, 15, 1)$ lies on line ℓ_6

$316: P_{16463} = (14, 1, 15, 1)$ lies on line ℓ_{10}

$317: P_{16464} = (15, 1, 15, 1)$ lies on line ℓ_9

$318: P_{16879} = (14, 14, 15, 1)$ lies on line ℓ_{14}

$319: P_{16880} = (15, 14, 15, 1)$ lies on line ℓ_{13}

$320: P_{16897} = (0, 15, 15, 1)$ lies on line ℓ_{11}

$321: P_{16898} = (1, 15, 15, 1)$ lies on line ℓ_{12}

$322: P_{17441} = (0, 0, 16, 1)$ lies on line ℓ_5

$323: P_{17442} = (1, 0, 16, 1)$ lies on line ℓ_6

$324: P_{17489} = (16, 1, 16, 1)$ lies on line ℓ_9

$325: P_{17490} = (17, 1, 16, 1)$ lies on line ℓ_{10}

$326: P_{17953} = (0, 16, 16, 1)$ lies on line ℓ_{11}

$327: P_{17954} = (1, 16, 16, 1)$ lies on line ℓ_{12}

$328: P_{18001} = (16, 17, 16, 1)$ lies on line ℓ_{13}

$329: P_{18002} = (17, 17, 16, 1)$ lies on line ℓ_{14}

$330: P_{18465} = (0, 0, 17, 1)$ lies on line ℓ_5

$331: P_{18466} = (1, 0, 17, 1)$ lies on line ℓ_6

$332: P_{18513} = (16, 1, 17, 1)$ lies on line ℓ_{10}

$333: P_{18514} = (17, 1, 17, 1)$ lies on line ℓ_9

$334: P_{18993} = (16, 16, 17, 1)$ lies on line ℓ_{14}

$335: P_{18994} = (17, 16, 17, 1)$ lies on line ℓ_{13}

$336: P_{19009} = (0, 17, 17, 1)$ lies on line ℓ_{11}

$337: P_{19010} = (1, 17, 17, 1)$ lies on line ℓ_{12}

$338: P_{19489} = (0, 0, 18, 1)$ lies on line ℓ_5

$339: P_{19490} = (1, 0, 18, 1)$ lies on line ℓ_6

$340: P_{19539} = (18, 1, 18, 1)$ lies on line ℓ_9

$341: P_{19540} = (19, 1, 18, 1)$ lies on line ℓ_{10}

$342: P_{20065} = (0, 18, 18, 1)$ lies on line ℓ_{11}

$343: P_{20066} = (1, 18, 18, 1)$ lies on line ℓ_{12}

$344: P_{20115} = (18, 19, 18, 1)$ lies on line ℓ_{13}

$345: P_{20116} = (19, 19, 18, 1)$ lies on line ℓ_{14}

$346: P_{20513} = (0, 0, 19, 1)$ lies on line ℓ_5

$347: P_{20514} = (1, 0, 19, 1)$ lies on line ℓ_6

$348: P_{20563} = (18, 1, 19, 1)$ lies on line ℓ_{10}

$349: P_{20564} = (19, 1, 19, 1)$ lies on line ℓ_9

$350: P_{21107} = (18, 18, 19, 1)$ lies on line ℓ_{14}

$351: P_{21108} = (19, 18, 19, 1)$ lies on line ℓ_{13}

$352: P_{21121} = (0, 19, 19, 1)$ lies on line ℓ_{11}

$353: P_{21122} = (1, 19, 19, 1)$ lies on line ℓ_{12}

$354: P_{21537} = (0, 0, 20, 1)$ lies on line ℓ_5

$355: P_{21538} = (1, 0, 20, 1)$ lies on line ℓ_6

$356: P_{21589} = (20, 1, 20, 1)$ lies on line ℓ_9

$357: P_{21590} = (21, 1, 20, 1)$ lies on line ℓ_{10}

$358: P_{22177} = (0, 20, 20, 1)$ lies on line ℓ_{11}

$359: P_{22178} = (1, 20, 20, 1)$ lies on line ℓ_{12}

$360: P_{22229} = (20, 21, 20, 1)$ lies on line ℓ_{13}

$361: P_{22230} = (21, 21, 20, 1)$ lies on line ℓ_{14}

$362: P_{22561} = (0, 0, 21, 1)$ lies on line ℓ_5

$363: P_{22562} = (1, 0, 21, 1)$ lies on line ℓ_6

$364: P_{22613} = (20, 1, 21, 1)$ lies on line ℓ_{10}

$365: P_{22614} = (21, 1, 21, 1)$ lies on line ℓ_9

$366: P_{23221} = (20, 20, 21, 1)$ lies on line ℓ_{14}

$367: P_{23222} = (21, 20, 21, 1)$ lies on line ℓ_{13}

$368: P_{23233} = (0, 21, 21, 1)$ lies on line ℓ_{11}

$369: P_{23234} = (1, 21, 21, 1)$ lies on line ℓ_{12}

$370: P_{23585} = (0, 0, 22, 1)$ lies on line ℓ_5

$371: P_{23586} = (1, 0, 22, 1)$ lies on line ℓ_6

$372: P_{23639} = (22, 1, 22, 1)$ lies on line ℓ_9

$373: P_{23640} = (23, 1, 22, 1)$ lies on line ℓ_{10}

$374: P_{24289} = (0, 22, 22, 1)$ lies on line ℓ_{11}

$375: P_{24290} = (1, 22, 22, 1)$ lies on line ℓ_{12}

$376: P_{24343} = (22, 23, 22, 1)$ lies on line ℓ_{13}

$377: P_{24344} = (23, 23, 22, 1)$ lies on line ℓ_{14}

$378: P_{24609} = (0, 0, 23, 1)$ lies on line ℓ_5

$379: P_{24610} = (1, 0, 23, 1)$ lies on line ℓ_6

$380: P_{24663} = (22, 1, 23, 1)$ lies on line ℓ_{10}

$381: P_{24664} = (23, 1, 23, 1)$ lies on line ℓ_9

$382: P_{25335} = (22, 22, 23, 1)$ lies on line ℓ_{14}

$383: P_{25336} = (23, 22, 23, 1)$ lies on line ℓ_{13}

$384: P_{25345} = (0, 23, 23, 1)$ lies on line ℓ_{11}

$385: P_{25346} = (1, 23, 23, 1)$ lies on line ℓ_{12}

$386: P_{25633} = (0, 0, 24, 1)$ lies on line ℓ_5

$387: P_{25634} = (1, 0, 24, 1)$ lies on line ℓ_6

$388: P_{25689} = (24, 1, 24, 1)$ lies on line ℓ_9

$389: P_{25690} = (25, 1, 24, 1)$ lies on line ℓ_{10}

$390: P_{26401} = (0, 24, 24, 1)$ lies on line ℓ_{11}

$391: P_{26402} = (1, 24, 24, 1)$ lies on line ℓ_{12}

$392: P_{26457} = (24, 25, 24, 1)$ lies on line ℓ_{13}

$393: P_{26458} = (25, 25, 24, 1)$ lies on line ℓ_{14}

$394: P_{26657} = (0, 0, 25, 1)$ lies on line ℓ_5

$395: P_{26658} = (1, 0, 25, 1)$ lies on line ℓ_6

$396: P_{26713} = (24, 1, 25, 1)$ lies on line ℓ_{10}

$397: P_{26714} = (25, 1, 25, 1)$ lies on line ℓ_9

$398: P_{27449} = (24, 24, 25, 1)$ lies on line ℓ_{14}

$399: P_{27450} = (25, 24, 25, 1)$ lies on line ℓ_{13}

$400: P_{27457} = (0, 25, 25, 1)$ lies on line ℓ_{11}

$401: P_{27458} = (1, 25, 25, 1)$ lies on line ℓ_{12}

$402: P_{27681} = (0, 0, 26, 1)$ lies on line ℓ_5

$403: P_{27682} = (1, 0, 26, 1)$ lies on line ℓ_6

$404: P_{27739} = (26, 1, 26, 1)$ lies on line ℓ_9

$405: P_{27740} = (27, 1, 26, 1)$ lies on line ℓ_{10}

$406 : P_{28513} = (0, 26, 26, 1)$ lies on line ℓ_{11}
$407 : P_{28514} = (1, 26, 26, 1)$ lies on line ℓ_{12}
$408 : P_{28571} = (26, 27, 26, 1)$ lies on line ℓ_{13}
$409 : P_{28572} = (27, 27, 26, 1)$ lies on line ℓ_{14}
$410 : P_{28705} = (0, 0, 27, 1)$ lies on line ℓ_{5}
$411 : P_{28706} = (1, 0, 27, 1)$ lies on line ℓ_{6}
$412 : P_{28763} = (26, 1, 27, 1)$ lies on line ℓ_{10}
$413 : P_{28764} = (27, 1, 27, 1)$ lies on line ℓ_{9}
$414 : P_{29563} = (26, 26, 27, 1)$ lies on line ℓ_{14}
$415 : P_{29564} = (27, 26, 27, 1)$ lies on line ℓ_{13}
$416 : P_{29569} = (0, 27, 27, 1)$ lies on line ℓ_{11}
$417 : P_{29570} = (1, 27, 27, 1)$ lies on line ℓ_{12}
$418 : P_{29729} = (0, 0, 28, 1)$ lies on line ℓ_{5}
$419 : P_{29730} = (1, 0, 28, 1)$ lies on line ℓ_{6}
$420 : P_{29789} = (28, 1, 28, 1)$ lies on line ℓ_{9}
$421 : P_{29790} = (29, 1, 28, 1)$ lies on line ℓ_{10}
$422 : P_{30625} = (0, 28, 28, 1)$ lies on line ℓ_{11}
$423 : P_{30626} = (1, 28, 28, 1)$ lies on line ℓ_{12}
$424 : P_{30685} = (28, 29, 28, 1)$ lies on line ℓ_{13}
$425 : P_{30686} = (29, 29, 28, 1)$ lies on line ℓ_{14}
$426 : P_{30753} = (0, 0, 29, 1)$ lies on line ℓ_{5}
$427 : P_{30754} = (1, 0, 29, 1)$ lies on line ℓ_{6}
$428 : P_{30813} = (28, 1, 29, 1)$ lies on line ℓ_{10}

$429 : P_{30814} = (29, 1, 29, 1)$ lies on line ℓ_{9}
$430 : P_{31677} = (28, 28, 29, 1)$ lies on line ℓ_{14}
$431 : P_{31678} = (29, 28, 29, 1)$ lies on line ℓ_{13}
$432 : P_{31681} = (0, 29, 29, 1)$ lies on line ℓ_{11}
$433 : P_{31682} = (1, 29, 29, 1)$ lies on line ℓ_{12}
$434 : P_{31777} = (0, 0, 30, 1)$ lies on line ℓ_{5}
$435 : P_{31778} = (1, 0, 30, 1)$ lies on line ℓ_{6}
$436 : P_{31839} = (30, 1, 30, 1)$ lies on line ℓ_{9}
$437 : P_{31840} = (31, 1, 30, 1)$ lies on line ℓ_{10}
$438 : P_{32737} = (0, 30, 30, 1)$ lies on line ℓ_{11}
$439 : P_{32738} = (1, 30, 30, 1)$ lies on line ℓ_{12}
$440 : P_{32799} = (30, 31, 30, 1)$ lies on line ℓ_{13}
$441 : P_{32800} = (31, 31, 30, 1)$ lies on line ℓ_{14}
$442 : P_{32801} = (0, 0, 31, 1)$ lies on line ℓ_{5}
$443 : P_{32802} = (1, 0, 31, 1)$ lies on line ℓ_{6}
$444 : P_{32863} = (30, 1, 31, 1)$ lies on line ℓ_{10}
$445 : P_{32864} = (31, 1, 31, 1)$ lies on line ℓ_{9}
$446 : P_{33791} = (30, 30, 31, 1)$ lies on line ℓ_{14}
$447 : P_{33792} = (31, 30, 31, 1)$ lies on line ℓ_{13}
$448 : P_{33793} = (0, 31, 31, 1)$ lies on line ℓ_{11}
$449 : P_{33794} = (1, 31, 31, 1)$ lies on line ℓ_{12}

The single points on the surface are:

Points on surface but on no line

The surface has 720 points not on any line:
The points on the surface but not on lines are:

$0 : P_{3499} = (10, 12, 2, 1)$
$1 : P_{3500} = (11, 12, 2, 1)$
$2 : P_{3529} = (8, 13, 2, 1)$
$3 : P_{3530} = (9, 13, 2, 1)$
$4 : P_{3563} = (10, 14, 2, 1)$
$5 : P_{3564} = (11, 14, 2, 1)$
$6 : P_{3593} = (8, 15, 2, 1)$
$7 : P_{3594} = (9, 15, 2, 1)$
$8 : P_{3631} = (14, 16, 2, 1)$
$9 : P_{3632} = (15, 16, 2, 1)$
$10 : P_{3661} = (12, 17, 2, 1)$
$11 : P_{3662} = (13, 17, 2, 1)$
$12 : P_{3695} = (14, 18, 2, 1)$
$13 : P_{3696} = (15, 18, 2, 1)$
$14 : P_{3725} = (12, 19, 2, 1)$
$15 : P_{3726} = (13, 19, 2, 1)$
$16 : P_{4005} = (4, 28, 2, 1)$
$17 : P_{4006} = (5, 28, 2, 1)$
$18 : P_{4039} = (6, 29, 2, 1)$
$19 : P_{4040} = (7, 29, 2, 1)$
$20 : P_{4069} = (4, 30, 2, 1)$

$21 : P_{4070} = (5, 30, 2, 1)$
$22 : P_{4103} = (6, 31, 2, 1)$
$23 : P_{4104} = (7, 31, 2, 1)$
$24 : P_{4519} = (6, 12, 3, 1)$
$25 : P_{4520} = (7, 12, 3, 1)$
$26 : P_{4549} = (4, 13, 3, 1)$
$27 : P_{4550} = (5, 13, 3, 1)$
$28 : P_{4581} = (4, 14, 3, 1)$
$29 : P_{4582} = (5, 14, 3, 1)$
$30 : P_{4615} = (6, 15, 3, 1)$
$31 : P_{4616} = (7, 15, 3, 1)$
$32 : P_{4671} = (30, 16, 3, 1)$
$33 : P_{4672} = (31, 16, 3, 1)$
$34 : P_{4701} = (28, 17, 3, 1)$
$35 : P_{4702} = (29, 17, 3, 1)$
$36 : P_{4733} = (28, 18, 3, 1)$
$37 : P_{4734} = (29, 18, 3, 1)$
$38 : P_{4767} = (30, 19, 3, 1)$
$39 : P_{4768} = (31, 19, 3, 1)$
$40 : P_{5049} = (24, 28, 3, 1)$
$41 : P_{5050} = (25, 28, 3, 1)$

$42: P_{5083} = (26, 29, 3, 1)$
$43: P_{5084} = (27, 29, 3, 1)$
$44: P_{5115} = (26, 30, 3, 1)$
$45: P_{5116} = (27, 30, 3, 1)$
$46: P_{5145} = (24, 31, 3, 1)$
$47: P_{5146} = (25, 31, 3, 1)$
$48: P_{5435} = (26, 8, 4, 1)$
$49: P_{5436} = (27, 8, 4, 1)$
$50: P_{5471} = (30, 9, 4, 1)$
$51: P_{5472} = (31, 9, 4, 1)$
$52: P_{5563} = (26, 12, 4, 1)$
$53: P_{5564} = (27, 12, 4, 1)$
$54: P_{5599} = (30, 13, 4, 1)$
$55: P_{5600} = (31, 13, 4, 1)$
$56: P_{5749} = (20, 18, 4, 1)$
$57: P_{5750} = (21, 18, 4, 1)$
$58: P_{5777} = (16, 19, 4, 1)$
$59: P_{5778} = (17, 19, 4, 1)$
$60: P_{5877} = (20, 22, 4, 1)$
$61: P_{5878} = (21, 22, 4, 1)$
$62: P_{5905} = (16, 23, 4, 1)$
$63: P_{5906} = (17, 23, 4, 1)$
$64: P_{5999} = (14, 26, 4, 1)$
$65: P_{6000} = (15, 26, 4, 1)$
$66: P_{6027} = (10, 27, 4, 1)$
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$472: P_{23415} = (22, 26, 21, 1)$

$473: P_{23416} = (23, 26, 21, 1)$

$474: P_{23427} = (2, 27, 21, 1)$

$475: P_{23428} = (3, 27, 21, 1)$

$476: P_{23467} = (10, 28, 21, 1)$

$477: P_{23468} = (11, 28, 21, 1)$

$478: P_{23519} = (30, 29, 21, 1)$

$479: P_{23520} = (31, 29, 21, 1)$

$480: P_{23733} = (20, 4, 22, 1)$

$481: P_{23734} = (21, 4, 22, 1)$

$482: P_{23747} = (2, 5, 22, 1)$

$483: P_{23748} = (3, 5, 22, 1)$

$484: P_{23923} = (18, 10, 22, 1)$

$485: P_{23924} = (19, 10, 22, 1)$

$486: P_{23941} = (4, 11, 22, 1)$

$487: P_{23942} = (5, 11, 22, 1)$

$488: P_{24039} = (6, 14, 22, 1)$

$489: P_{24040} = (7, 14, 22, 1)$

$490: P_{24081} = (16, 15, 22, 1)$

$491: P_{24082} = (17, 15, 22, 1)$

$492: P_{24181} = (20, 18, 22, 1)$

$493: P_{24182} = (21, 18, 22, 1)$

$494: P_{24195} = (2, 19, 22, 1)$

$495: P_{24196} = (3, 19, 22, 1)$

$496: P_{24359} = (6, 24, 22, 1)$

$497: P_{24360} = (7, 24, 22, 1)$

$498: P_{24401} = (16, 25, 22, 1)$

$499: P_{24402} = (17, 25, 22, 1)$

$500: P_{24499} = (18, 28, 22, 1)$

$501: P_{24500} = (19, 28, 22, 1)$

$502: P_{24517} = (4, 29, 22, 1)$

$503: P_{24518} = (5, 29, 22, 1)$

$504: P_{24753} = (16, 4, 23, 1)$

$505: P_{24754} = (17, 4, 23, 1)$

$506: P_{24775} = (6, 5, 23, 1)$

$507: P_{24776} = (7, 5, 23, 1)$

$508: P_{24953} = (24, 10, 23, 1)$

$509: P_{24954} = (25, 10, 23, 1)$

$510: P_{24975} = (14, 11, 23, 1)$

$511: P_{24976} = (15, 11, 23, 1)$

$512: P_{25065} = (8, 14, 23, 1)$

$513: P_{25066} = (9, 14, 23, 1)$

$514: P_{25119} = (30, 15, 23, 1)$

$515: P_{25120} = (31, 15, 23, 1)$

$516: P_{25191} = (6, 18, 23, 1)$

$517: P_{25192} = (7, 18, 23, 1)$

$518: P_{25233} = (16, 19, 23, 1)$

$519: P_{25234} = (17, 19, 23, 1)$

$520: P_{25407} = (30, 24, 23, 1)$

$521: P_{25408} = (31, 24, 23, 1)$

$522: P_{25417} = (8, 25, 23, 1)$

$523: P_{25418} = (9, 25, 23, 1)$

$524: P_{25519} = (14, 28, 23, 1)$

$525: P_{25520} = (15, 28, 23, 1)$

$526: P_{25561} = (24, 29, 23, 1)$

$527: P_{25562} = (25, 29, 23, 1)$

$528: P_{25835} = (10, 6, 24, 1)$

$529: P_{25836} = (11, 6, 24, 1)$

$530: P_{25875} = (18, 7, 24, 1)$

$531: P_{25876} = (19, 7, 24, 1)$

$532: P_{25901} = (12, 8, 24, 1)$

$533: P_{25902} = (13, 8, 24, 1)$

$534: P_{25941} = (20, 9, 24, 1)$

$535: P_{25942} = (21, 9, 24, 1)$

$536: P_{26087} = (6, 14, 24, 1)$

$537: P_{26088} = (7, 14, 24, 1)$

$538: P_{26143} = (30, 15, 24, 1)$

$539: P_{26144} = (31, 15, 24, 1)$

$540: P_{26157} = (12, 16, 24, 1)$

$541: P_{26158} = (13, 16, 24, 1)$

$542: P_{26197} = (20, 17, 24, 1)$

$543: P_{26198} = (21, 17, 24, 1)$

$544: P_{26343} = (6, 22, 24, 1)$

$545: P_{26344} = (7, 22, 24, 1)$

$546: P_{26399} = (30, 23, 24, 1)$

$547: P_{26400} = (31, 23, 24, 1)$

$548: P_{26603} = (10, 30, 24, 1)$

$549: P_{26604} = (11, 30, 24, 1)$

$550: P_{26643} = (18, 31, 24, 1)$

$551: P_{26644} = (19, 31, 24, 1)$

$552: P_{26861} = (12, 6, 25, 1)$

$553: P_{26862} = (13, 6, 25, 1)$

$554: P_{26901} = (20, 7, 25, 1)$

$555: P_{26902} = (21, 7, 25, 1)$

$556: P_{26917} = (4, 8, 25, 1)$

$557: P_{26918} = (5, 8, 25, 1)$

$558: P_{26973} = (28, 9, 25, 1)$

$559: P_{26974} = (29, 9, 25, 1)$

$560: P_{27113} = (8, 14, 25, 1)$

$561: P_{27114} = (9, 14, 25, 1)$

$562: P_{27153} = (16, 15, 25, 1)$

$563: P_{27154} = (17, 15, 25, 1)$

$564: P_{27197} = (28, 16, 25, 1)$

$565: P_{27198} = (29, 16, 25, 1)$

$566: P_{27205} = (4, 17, 25, 1)$

$567: P_{27206} = (5, 17, 25, 1)$

$568: P_{27377} = (16, 22, 25, 1)$

$569: P_{27378} = (17, 22, 25, 1)$

$570: P_{27401} = (8, 23, 25, 1)$

$571: P_{27402} = (9, 23, 25, 1)$

$572: P_{27637} = (20, 30, 25, 1)$

$573: P_{27638} = (21, 30, 25, 1)$

$574: P_{27661} = (12, 31, 25, 1)$

$575: P_{27662} = (13, 31, 25, 1)$

$576: P_{27823} = (14, 4, 26, 1)$

$577: P_{27824} = (15, 4, 26, 1)$

$578: P_{27861} = (20, 5, 26, 1)$

$579: P_{27862} = (21, 5, 26, 1)$

$580: P_{28003} = (2, 10, 26, 1)$

$581: P_{28004} = (3, 10, 26, 1)$

$582 : P_{28057} = (24, 11, 26, 1)$
$583 : P_{28058} = (25, 11, 26, 1)$
$584 : P_{28141} = (12, 14, 26, 1)$
$585 : P_{28142} = (13, 14, 26, 1)$
$586 : P_{28183} = (22, 15, 26, 1)$
$587 : P_{28184} = (23, 15, 26, 1)$
$588 : P_{28195} = (2, 16, 26, 1)$
$589 : P_{28196} = (3, 16, 26, 1)$
$590 : P_{28249} = (24, 17, 26, 1)$
$591 : P_{28250} = (25, 17, 26, 1)$
$592 : P_{28333} = (12, 20, 26, 1)$
$593 : P_{28334} = (13, 20, 26, 1)$
$594 : P_{28375} = (22, 21, 26, 1)$
$595 : P_{28376} = (23, 21, 26, 1)$
$596 : P_{28655} = (14, 30, 26, 1)$
$597 : P_{28656} = (15, 30, 26, 1)$
$598 : P_{28693} = (20, 31, 26, 1)$
$599 : P_{28694} = (21, 31, 26, 1)$
$600 : P_{28843} = (10, 4, 27, 1)$
$601 : P_{28844} = (11, 4, 27, 1)$
$602 : P_{28881} = (16, 5, 27, 1)$
$603 : P_{28882} = (17, 5, 27, 1)$
$604 : P_{29033} = (8, 10, 27, 1)$
$605 : P_{29034} = (9, 10, 27, 1)$
$606 : P_{29075} = (18, 11, 27, 1)$
$607 : P_{29076} = (19, 11, 27, 1)$
$608 : P_{29155} = (2, 14, 27, 1)$
$609 : P_{29156} = (3, 14, 27, 1)$
$610 : P_{29209} = (24, 15, 27, 1)$
$611 : P_{29210} = (25, 15, 27, 1)$
$612 : P_{29235} = (18, 16, 27, 1)$
$613 : P_{29236} = (19, 16, 27, 1)$
$614 : P_{29257} = (8, 17, 27, 1)$
$615 : P_{29258} = (9, 17, 27, 1)$
$616 : P_{29369} = (24, 20, 27, 1)$
$617 : P_{29370} = (25, 20, 27, 1)$
$618 : P_{29379} = (2, 21, 27, 1)$
$619 : P_{29380} = (3, 21, 27, 1)$
$620 : P_{29681} = (16, 30, 27, 1)$
$621 : P_{29682} = (17, 30, 27, 1)$
$622 : P_{29707} = (10, 31, 27, 1)$
$623 : P_{29708} = (11, 31, 27, 1)$
$624 : P_{29797} = (4, 2, 28, 1)$
$625 : P_{29798} = (5, 2, 28, 1)$
$626 : P_{29849} = (24, 3, 28, 1)$
$627 : P_{29850} = (25, 3, 28, 1)$
$628 : P_{30007} = (22, 8, 28, 1)$
$629 : P_{30008} = (23, 8, 28, 1)$
$630 : P_{30027} = (10, 9, 28, 1)$
$631 : P_{30028} = (11, 9, 28, 1)$
$632 : P_{30067} = (18, 10, 28, 1)$
$633 : P_{30068} = (19, 10, 28, 1)$
$634 : P_{30095} = (14, 11, 28, 1)$
$635 : P_{30096} = (15, 11, 28, 1)$

$636 : P_{30391} = (22, 20, 28, 1)$
$637 : P_{30392} = (23, 20, 28, 1)$
$638 : P_{30411} = (10, 21, 28, 1)$
$639 : P_{30412} = (11, 21, 28, 1)$
$640 : P_{30451} = (18, 22, 28, 1)$
$641 : P_{30452} = (19, 22, 28, 1)$
$642 : P_{30479} = (14, 23, 28, 1)$
$643 : P_{30480} = (15, 23, 28, 1)$
$644 : P_{30693} = (4, 30, 28, 1)$
$645 : P_{30694} = (5, 30, 28, 1)$
$646 : P_{30745} = (24, 31, 28, 1)$
$647 : P_{30746} = (25, 31, 28, 1)$
$648 : P_{30823} = (6, 2, 29, 1)$
$649 : P_{30824} = (7, 2, 29, 1)$
$650 : P_{30875} = (26, 3, 29, 1)$
$651 : P_{30876} = (27, 3, 29, 1)$
$652 : P_{31039} = (30, 8, 29, 1)$
$653 : P_{31040} = (31, 8, 29, 1)$
$654 : P_{31043} = (2, 9, 29, 1)$
$655 : P_{31044} = (3, 9, 29, 1)$
$656 : P_{31097} = (24, 10, 29, 1)$
$657 : P_{31098} = (25, 10, 29, 1)$
$658 : P_{31109} = (4, 11, 29, 1)$
$659 : P_{31110} = (5, 11, 29, 1)$
$660 : P_{31395} = (2, 20, 29, 1)$
$661 : P_{31396} = (3, 20, 29, 1)$
$662 : P_{31455} = (30, 21, 29, 1)$
$663 : P_{31456} = (31, 21, 29, 1)$
$664 : P_{31461} = (4, 22, 29, 1)$
$665 : P_{31462} = (5, 22, 29, 1)$
$666 : P_{31513} = (24, 23, 29, 1)$
$667 : P_{31514} = (25, 23, 29, 1)$
$668 : P_{31739} = (26, 30, 29, 1)$
$669 : P_{31740} = (27, 30, 29, 1)$
$670 : P_{31751} = (6, 31, 29, 1)$
$671 : P_{31752} = (7, 31, 29, 1)$
$672 : P_{31845} = (4, 2, 30, 1)$
$673 : P_{31846} = (5, 2, 30, 1)$
$674 : P_{31899} = (26, 3, 30, 1)$
$675 : P_{31900} = (27, 3, 30, 1)$
$676 : P_{31919} = (14, 4, 30, 1)$
$677 : P_{31920} = (15, 4, 30, 1)$
$678 : P_{31953} = (16, 5, 30, 1)$
$679 : P_{31954} = (17, 5, 30, 1)$
$680 : P_{31979} = (10, 6, 30, 1)$
$681 : P_{31980} = (11, 6, 30, 1)$
$682 : P_{32021} = (20, 7, 30, 1)$
$683 : P_{32022} = (21, 7, 30, 1)$
$684 : P_{32555} = (10, 24, 30, 1)$
$685 : P_{32556} = (11, 24, 30, 1)$
$686 : P_{32597} = (20, 25, 30, 1)$
$687 : P_{32598} = (21, 25, 30, 1)$
$688 : P_{32623} = (14, 26, 30, 1)$
$689 : P_{32624} = (15, 26, 30, 1)$

$690 : P_{32657} = (16, 27, 30, 1)$
$691 : P_{32658} = (17, 27, 30, 1)$
$692 : P_{32677} = (4, 28, 30, 1)$
$693 : P_{32678} = (5, 28, 30, 1)$
$694 : P_{32731} = (26, 29, 30, 1)$
$695 : P_{32732} = (27, 29, 30, 1)$
$696 : P_{32871} = (6, 2, 31, 1)$
$697 : P_{32872} = (7, 2, 31, 1)$
$698 : P_{32921} = (24, 3, 31, 1)$
$699 : P_{32922} = (25, 3, 31, 1)$
$700 : P_{32939} = (10, 4, 31, 1)$
$701 : P_{32940} = (11, 4, 31, 1)$
$702 : P_{32981} = (20, 5, 31, 1)$
$703 : P_{32982} = (21, 5, 31, 1)$
$704 : P_{33005} = (12, 6, 31, 1)$
$705 : P_{33006} = (13, 6, 31, 1)$

$706 : P_{33043} = (18, 7, 31, 1)$
$707 : P_{33044} = (19, 7, 31, 1)$
$708 : P_{33587} = (18, 24, 31, 1)$
$709 : P_{33588} = (19, 24, 31, 1)$
$710 : P_{33613} = (12, 25, 31, 1)$
$711 : P_{33614} = (13, 25, 31, 1)$
$712 : P_{33653} = (20, 26, 31, 1)$
$713 : P_{33654} = (21, 26, 31, 1)$
$714 : P_{33675} = (10, 27, 31, 1)$
$715 : P_{33676} = (11, 27, 31, 1)$
$716 : P_{33721} = (24, 28, 31, 1)$
$717 : P_{33722} = (25, 28, 31, 1)$
$718 : P_{33735} = (6, 29, 31, 1)$
$719 : P_{33736} = (7, 29, 31, 1)$

Line Intersection Graph

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
0	0	1	1	1	1	0	0	1	1	0	0	0	0	0	0
1	1	0	1	0	0	0	0	0	0	0	0	1	1	1	1
2	1	1	0	0	0	1	1	0	0	1	1	0	0	0	0
3	1	0	0	0	1	1	0	0	0	1	0	1	0	1	0
4	1	0	0	1	0	0	1	0	0	0	1	0	1	0	1
5	0	0	1	1	0	0	1	1	0	0	0	1	0	0	1
6	0	0	1	0	1	1	0	0	1	0	0	0	1	1	0
7	1	0	0	0	0	1	0	0	1	1	0	0	1	0	1
8	1	0	0	0	0	0	1	1	0	0	1	1	0	1	0
9	0	0	1	1	0	0	0	1	0	0	1	0	1	1	0
10	0	0	1	0	1	0	0	0	1	1	0	1	0	0	1
11	0	1	0	1	0	1	0	0	1	0	1	0	1	0	0
12	0	1	0	0	1	0	1	1	0	1	0	1	0	0	0
13	0	1	0	1	0	0	1	0	1	0	1	1	0	0	1
14	0	1	0	0	1	1	0	1	0	1	0	0	0	1	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_7	ℓ_8
in point	P_0	P_0	P_1	P_1	P_5	P_5

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}
in point	P_0	P_0	P_{67}	P_{67}	P_{68}	P_{68}

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_5	ℓ_6	ℓ_9	ℓ_{10}
in point	P_0	P_0	P_2	P_2	P_{36}	P_{36}

Line 3 intersects

Line	ℓ_0	ℓ_4	ℓ_5	ℓ_9	ℓ_{11}	ℓ_{13}
in point	P_1	P_1	P_3	P_{1090}	P_3	P_{1090}

Line 4 intersects

Line	ℓ_0	ℓ_3	ℓ_6	ℓ_{10}	ℓ_{12}	ℓ_{14}
in point	P_1	P_1	P_{1059}	P_{1091}	P_{1059}	P_{1091}

Line 5 intersects

Line	ℓ_2	ℓ_3	ℓ_6	ℓ_7	ℓ_{11}	ℓ_{14}
in point	P_2	P_3	P_2	P_{2082}	P_3	P_{2082}

Line 6 intersects

Line	ℓ_2	ℓ_4	ℓ_5	ℓ_8	ℓ_{12}	ℓ_{13}
in point	P_2	P_{1059}	P_2	P_{2083}	P_{1059}	P_{2083}

Line 7 intersects

Line	ℓ_0	ℓ_5	ℓ_8	ℓ_9	ℓ_{12}	ℓ_{14}
in point	P_5	P_{2082}	P_5	P_4	P_4	P_{2082}

Line 8 intersects

Line	ℓ_0	ℓ_6	ℓ_7	ℓ_{10}	ℓ_{11}	ℓ_{13}
in point	P_5	P_{2083}	P_5	P_{2114}	P_{2114}	P_{2083}

Line 9 intersects

Line	ℓ_2	ℓ_3	ℓ_7	ℓ_{10}	ℓ_{12}	ℓ_{13}
in point	P_{36}	P_{1090}	P_4	P_{36}	P_4	P_{1090}

Line 10 intersects

Line	ℓ_2	ℓ_4	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{14}
in point	P_{36}	P_{1091}	P_{2114}	P_{36}	P_{2114}	P_{1091}

Line 11 intersects

Line	ℓ_1	ℓ_3	ℓ_5	ℓ_8	ℓ_{10}	ℓ_{12}
in point	P_{67}	P_3	P_3	P_{2114}	P_{2114}	P_{67}

Line 12 intersects

Line	ℓ_1	ℓ_4	ℓ_6	ℓ_7	ℓ_9	ℓ_{11}
in point	P_{67}	P_{1059}	P_{1059}	P_4	P_4	P_{67}

Line 13 intersects

Line	ℓ_1	ℓ_3	ℓ_6	ℓ_8	ℓ_9	ℓ_{14}
in point	P_{68}	P_{1090}	P_{2083}	P_{2083}	P_{1090}	P_{68}

Line 14 intersects

Line	ℓ_1	ℓ_4	ℓ_5	ℓ_7	ℓ_{10}	ℓ_{13}
in point	P_{68}	P_{1091}	P_{2082}	P_{2082}	P_{1091}	P_{68}

The surface has 1185 points:
Too many to print.