Rank-76099 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

$$X_0^2X_3 + X_1^2X_2 + X_1X_2^2 + X_0X_3^2 + X_0X_1X_2 = 0$$

(0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(64) is 1090785349

General information

Number of lines	27
Number of points	4545
Number of singular points	0
Number of Eckardt points	13
Number of double points	96
Number of single points	1524
Number of points off lines	2912
Number of Hesse planes	0
Number of axes	16
Type of points on lines	65^{27}
Type of lines on points	3^{13}, 2^{96}, 1^{1524}, 0^{2912}

Singular Points

The surface has 0 singular points:

The 27 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = a_1 = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{4096} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{4096} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

$$\ell_1 = a_2 = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{17043520} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{17043520} = \mathbf{Pl}(0,0,0,1,0,0)_{129}$$

$$\ell_2 = a_3 = \left[\begin{array}{cccc} 1 & \epsilon^{9} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{36} \end{array}\right]_{199699} = \left[\begin{array}{cccc} 1 & 47 & 0 & 0 \\ 0 & 0 & 1 & 36 \end{array}\right]_{199699} = \mathbf{Pl}(0,0,46,36,46,1)_{12343893}$$

$$\ell_3 = a_4 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{45} & 1 \\ 0 & 1 & 1 & \epsilon^{18} \end{array}\right]_{420966} = \left[\begin{array}{cccc} 1 & 0 & 37 & 1 \\ 0 & 1 & 1 & 11 \end{array}\right]_{420966} = \mathbf{Pl}(37,0,37,11,36,1)_{9721987}$$

$$\ell_4 = a_5 = \left[\begin{array}{cccc} 1 & \epsilon^{18} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{9} \end{array}\right]_{49914} = \left[\begin{array}{cccc} 1 & 11 & 0 & 0 \\ 0 & 0 & 1 & 47 \end{array}\right]_{49914} = \mathbf{Pl}(0,0,10,47,10,1)_{2904441}$$

$$\ell_5 = a_6 = \left[\begin{array}{cccc} 1 & \epsilon^{36} & 0 & 1 \\ 0 & 0 & 1 & \epsilon^{18} \end{array}\right]_{420207} = \left[\begin{array}{cccc} 1 & 36 & 0 & 1 \\ 0 & 0 & 1 & 11 \end{array}\right]_{420207} = \mathbf{Pl}(0,46,37,11,37,1)_{9984139}$$

$$\ell_6 = b_1 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{36} & 1 \\ 0 & 1 & 0 & \epsilon^{18} \end{array}\right]_{416804} = \left[\begin{array}{cccc} 1 & 0 & 36 & 1 \\ 0 & 1 & 0 & 11 \end{array}\right]_{416804} = \mathbf{Pl}(37,11,0,46,37,1)_{9978360}$$

$$\ell_7 = b_2 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{45} & 0 \\ 0 & 1 & 1 & \epsilon^{18} \end{array}\right]_{154662} = \left[\begin{array}{cccc} 1 & 0 & 37 & 0 \\ 0 & 1 & 1 & 11 \end{array}\right]_{154662} = \mathbf{Pl}(37,11,37,0,36,1)_{9711744}$$

$$\ell_8 = b_3 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{18} & 0 \\ 0 & 1 & 0 & \epsilon^{9} \end{array}\right]_{48779} = \left[\begin{array}{cccc} 1 & 0 & 11 & 0 \\ 0 & 1 & 0 & 47 \end{array}\right]_{48779} = \mathbf{Pl}(10,47,0,0,10,1)_{2895306}$$

$$\ell_9 = b_4 = \left[\begin{array}{cccc} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{17047616} = \left[\begin{array}{cccc} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{17047616} = \mathbf{Pl}(0,1,0,0,0,0)_{1}$$

$$\ell_{10} = b_5 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{9} & 0 \\ 0 & 1 & 0 & \epsilon^{36} \end{array}\right]_{197871} = \left[\begin{array}{cccc} 1 & 0 & 47 & 0 \\ 0 & 1 & 0 & 36 \end{array}\right]_{197871} = \mathbf{Pl}(46,36,0,0,46,1)_{12330222}$$

$$\ell_{11} = b_6 = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{array}\right]_{0} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{array}\right]_{0} = \mathbf{Pl}(1,0,0,0,0,0)_{0}$$

$$\ell_{12} = c_{12} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{36} & 0 \\ 0 & 1 & 0 & \epsilon^{18} \end{array}\right]_{150500} = \left[\begin{array}{cccc} 1 & 0 & 36 & 0 \\ 0 & 1 & 0 & 11 \end{array}\right]_{150500} = \mathbf{Pl}(37,11,0,0,37,1)_{9971493}$$

$$\ell_{13} = c_{13} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{54} & 0 \\ 0 & 1 & 1 & \epsilon^{9} \end{array}\right]_{44619} = \left[\begin{array}{cccc} 1 & 0 & 10 & 0 \\ 0 & 1 & 1 & 47 \end{array}\right]_{44619} = \mathbf{Pl}(10,47,10,0,11,1)_{3158016}$$

$$\ell_{14} = c_{14} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{array}\right]_{270400} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{array}\right]_{270400} = \mathbf{Pl}(0,1,1,0,0,0)_{66}$$

$$\ell_{15} = c_{15} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{27} & 0 \\ 0 & 1 & 1 & \epsilon^{36} \end{array}\right]_{193711} = \left[\begin{array}{cccc} 1 & 0 & 46 & 0 \\ 0 & 1 & 1 & 36 \end{array}\right]_{193711} = \mathbf{Pl}(46,36,46,0,47,1)_{12595200}$$

$$\ell_{16} = c_{16} = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 \end{array}\right]_{4162} = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 \end{array}\right]_{4162} = \mathbf{Pl}(1,0,1,0,0,1)_{270529}$$

$$\ell_{17} = c_{23} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{18} & 1 \\ 0 & 1 & 0 & \epsilon^{9} \end{array}\right]_{315083} = \left[\begin{array}{cccc} 1 & 0 & 11 & 1 \\ 0 & 1 & 0 & 47 \end{array}\right]_{315083} = \mathbf{Pl}(10,47,0,37,10,1)_{2901606}$$

$$\ell_{18} = c_{24} = \left[\begin{array}{cccc} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{17043585} = \left[\begin{array}{cccc} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{17043585} = \mathbf{Pl}(0,1,0,1,0,0)_{193}$$

$$\ell_{19} = c_{25} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{9} & 1 \\ 0 & 1 & 0 & \epsilon^{36} \end{array}\right]_{464175} = \left[\begin{array}{cccc} 1 & 0 & 47 & 1 \\ 0 & 1 & 0 & 36 \end{array}\right]_{464175} = \mathbf{Pl}(46,36,0,10,46,1)_{12334821}$$

$$\ell_{20} = c_{26} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{array}\right]_{266304} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{array}\right]_{266304} = \mathbf{Pl}(1,0,0,1,0,0)_{130}$$

$$\ell_{21} = c_{34} = \left[\begin{array}{cccc} 1 & \epsilon^{9} & 0 & 1 \\ 0 & 0 & 1 & \epsilon^{36} \end{array}\right]_{466003} = \left[\begin{array}{cccc} 1 & 47 & 0 & 1 \\ 0 & 0 & 1 & 36 \end{array}\right]_{466003} = \mathbf{Pl}(0,10,46,36,46,1)_{12343966}$$

$$\ell_{22} = c_{35} = \left[\begin{array}{cccc} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{array}\right]_{270466} = \left[\begin{array}{cccc} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{array}\right]_{270466} = \mathbf{Pl}(1,1,1,1,0,1)_{286530}$$

$$\ell_{23} = c_{36} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{27} & 1 \\ 0 & 1 & 1 & \epsilon^{36} \end{array}\right]_{460015} = \left[\begin{array}{cccc} 1 & 0 & 46 & 1 \\ 0 & 1 & 1 & 36 \end{array}\right]_{460015} = \mathbf{Pl}(46,0,46,36,47,1)_{12606019}$$

$$\ell_{24} = c_{45} = \left[\begin{array}{cccc} 1 & \epsilon^{18} & 0 & 1 \\ 0 & 0 & 1 & \epsilon^{9} \end{array}\right]_{316218} = \left[\begin{array}{cccc} 1 & 11 & 0 & 1 \\ 0 & 0 & 1 & 47 \end{array}\right]_{316218} = \mathbf{Pl}(0,37,10,47,10,1)_{2904541}$$

$$\ell_{25} = c_{46} = \left[\begin{array}{cccc} 1 & \epsilon^{36} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{18} \end{array}\right]_{153903} = \left[\begin{array}{cccc} 1 & 36 & 0 & 0 \\ 0 & 0 & 1 & 11 \end{array}\right]_{153903} = \mathbf{Pl}(0,0,37,11,37,1)_{9984030}$$

$$\ell_{26} = c_{56} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{54} & 1 \\ 0 & 1 & 1 & \epsilon^{9} \end{array}\right]_{310923} = \left[\begin{array}{cccc} 1 & 0 & 10 & 1 \\ 0 & 1 & 1 & 47 \end{array}\right]_{310923} = \mathbf{Pl}(10,0,10,47,11,1)_{3166531}$$

Rank of lines: (4096, 17043520, 199699, 420966, 49914, 420207, 416804, 154662, 48779, 17047616, 197871, 0, 150500, 44619, 270400, 193711, 4162, 315083, 17043585, 464175, 266304, 466003, 270466, 460015, 316218, 153903, 310923)
Rank of points on Klein quadric: (2, 129, 12343893, 9721987, 2904441, 9984139, 9978360, 9711744, 2895306, 1, 12330222, 0, 9971493, 3158016, 66, 12595200, 270529, 2901606, 193, 12334821, 130, 12343966, 286530, 12606019, 2904541, 9984030, 3166531)

Eckardt Points

The surface has 13 Eckardt points:
$0 : E_{26} = a_2 \cap b_6 \cap c_{26} = P_1 = \mathbf{P}(0,1,0,0) = \mathbf{P}(0,1,0,0)$,
$1 : E_{14} = a_1 \cap b_4 \cap c_{14} = P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$,
$2 : E_{24} = a_2 \cap b_4 \cap c_{24} = P_3 = \mathbf{P}(0,0,0,1) = \mathbf{P}(0,0,0,1)$,
$3 : E_{16,24,35} = c_{16} \cap c_{24} \cap c_{35} = P_{131} = \mathbf{P}(0,1,1,0) = \mathbf{P}(0,1,1,0)$,
$4 : E_{23} = a_2 \cap b_3 \cap c_{23} = P_{4802} = \mathbf{P}(0,\epsilon^{54},0,1) = \mathbf{P}(0,10,0,1)$,
$5 : E_{21} = a_2 \cap b_1 \cap c_{12} = P_{6530} = \mathbf{P}(0,\epsilon^{45},0,1) = \mathbf{P}(0,37,0,1)$,
$6 : E_{25} = a_2 \cap b_5 \cap c_{25} = P_{7106} = \mathbf{P}(0,\epsilon^{27},0,1) = \mathbf{P}(0,46,0,1)$,
$7 : E_{54} = a_5 \cap b_4 \cap c_{45} = P_{45121} = \mathbf{P}(0,0,\epsilon^{54},1) = \mathbf{P}(0,0,10,1)$,
$8 : E_{13,24,56} = c_{13} \cap c_{24} \cap c_{56} = P_{45761} = \mathbf{P}(0,\epsilon^{54},\epsilon^{54},1) = \mathbf{P}(0,10,10,1)$,
$9 : E_{64} = a_6 \cap b_4 \cap c_{46} = P_{155713} = \mathbf{P}(0,0,\epsilon^{45},1) = \mathbf{P}(0,0,37,1)$,
$10 : E_{42} = a_4 \cap b_2 \cap c_{24} = P_{158081} = \mathbf{P}(0,\epsilon^{45},\epsilon^{45},1) = \mathbf{P}(0,37,37,1)$,
$11 : E_{34} = a_3 \cap b_4 \cap c_{34} = P_{192577} = \mathbf{P}(0,0,\epsilon^{27},1) = \mathbf{P}(0,0,46,1)$,
$12 : E_{15,24,36} = c_{15} \cap c_{24} \cap c_{36} = P_{195521} = \mathbf{P}(0,\epsilon^{27},\epsilon^{27},1) = \mathbf{P}(0,46,46,1)$.

Double Points

The surface has 96 Double points:
The double points on the surface are:

$P_{78} = (11,0,1,0) = \ell_0 \cap \ell_7 = a_1 \cap b_2$
$P_{104} = (37,0,1,0) = \ell_0 \cap \ell_8 = a_1 \cap b_3$
$P_{77} = (10,0,1,0) = \ell_0 \cap \ell_{10} = a_1 \cap b_5$
$P_0 = (1,0,0,0) = \ell_0 \cap \ell_{11} = a_1 \cap b_6$
$P_{113} = (46,0,1,0) = \ell_0 \cap \ell_{12} = a_1 \cap c_{12}$
$P_{114} = (47,0,1,0) = \ell_0 \cap \ell_{13} = a_1 \cap c_{13}$
$P_{103} = (36,0,1,0) = \ell_0 \cap \ell_{15} = a_1 \cap c_{15}$
$P_{68} = (1,0,1,0) = \ell_0 \cap \ell_{16} = a_1 \cap c_{16}$
$P_{192651} = (10,1,46,1) = \ell_2 \cap \ell_6 = a_3 \cap b_1$
$P_{194981} = (36,37,46,1) = \ell_2 \cap \ell_7 = a_3 \cap b_2$
$P_{195532} = (11,46,46,1) = \ell_2 \cap \ell_{10} = a_3 \cap b_5$
$P_{14} = (10,1,0,0) = \ell_2 \cap \ell_{11} = a_3 \cap b_6$
$P_{193254} = (37,10,46,1) = \ell_2 \cap \ell_{13} = a_3 \cap c_{13}$
$P_{193328} = (47,11,46,1) = \ell_2 \cap \ell_{17} = a_3 \cap c_{23}$
$P_{195586} = (1,47,46,1) = \ell_2 \cap \ell_{22} = a_3 \cap c_{35}$
$P_{194927} = (46,36,46,1) = \ell_2 \cap \ell_{23} = a_3 \cap c_{36}$
$P_{158768} = (47,47,37,1) = \ell_3 \cap \ell_6 = a_4 \cap b_1$
$P_{156399} = (46,10,37,1) = \ell_3 \cap \ell_8 = a_4 \cap b_3$
$P_{158693} = (36,46,37,1) = \ell_3 \cap \ell_{10} = a_4 \cap b_5$
$P_{15} = (11,1,0,0) = \ell_3 \cap \ell_{11} = a_4 \cap b_6$
$P_{155714} = (1,0,37,1) = \ell_3 \cap \ell_{14} = a_4 \cap c_{14}$
$P_{155787} = (10,1,37,1) = \ell_3 \cap \ell_{21} = a_4 \cap c_{34}$
$P_{158028} = (11,36,37,1) = \ell_3 \cap \ell_{24} = a_4 \cap c_{45}$
$P_{156454} = (37,11,37,1) = \ell_3 \cap \ell_{25} = a_4 \cap c_{46}$

$P_{47436} = (11, 36, 10, 1) = \ell_4 \cap \ell_6 = a_5 \cap b_1$
$P_{47535} = (46, 37, 10, 1) = \ell_4 \cap \ell_7 = a_5 \cap b_2$
$P_{45797} = (36, 10, 10, 1) = \ell_4 \cap \ell_8 = a_5 \cap b_3$
$P_{41} = (37, 1, 0, 0) = \ell_4 \cap \ell_{11} = a_5 \cap b_6$
$P_{48112} = (47, 46, 10, 1) = \ell_4 \cap \ell_{15} = a_5 \cap c_{15}$
$P_{45222} = (37, 1, 10, 1) = \ell_4 \cap \ell_{19} = a_5 \cap c_{25}$
$P_{45826} = (1, 11, 10, 1) = \ell_4 \cap \ell_{22} = a_5 \cap c_{35}$
$P_{48139} = (10, 47, 10, 1) = \ell_4 \cap \ell_{26} = a_5 \cap c_{56}$
$P_{49958} = (37, 11, 11, 1) = \ell_5 \cap \ell_6 = a_6 \cap b_1$
$P_{199088} = (47, 37, 47, 1) = \ell_5 \cap \ell_7 = a_6 \cap b_2$
$P_{152268} = (11, 10, 36, 1) = \ell_5 \cap \ell_8 = a_6 \cap b_3$
$P_{11211} = (10, 46, 1, 1) = \ell_5 \cap \ell_{10} = a_6 \cap b_5$
$P_{718} = (11, 10, 1, 0) = \ell_5 \cap \ell_{16} = a_6 \cap c_{16}$
$P_{6467} = (1, 36, 0, 1) = \ell_5 \cap \ell_{20} = a_6 \cap c_{26}$
$P_{195621} = (36, 47, 46, 1) = \ell_5 \cap \ell_{23} = a_6 \cap c_{36}$
$P_{45231} = (46, 1, 10, 1) = \ell_5 \cap \ell_{26} = a_6 \cap c_{56}$
$P_{8943} = (46, 10, 1, 1) = \ell_6 \cap \ell_{13} = b_1 \cap c_{13}$
$P_{151618} = (1, 0, 36, 1) = \ell_6 \cap \ell_{14} = b_1 \cap c_{14}$
$P_{199653} = (36, 46, 47, 1) = \ell_6 \cap \ell_{15} = b_1 \cap c_{15}$
$P_{3121} = (46, 47, 1, 0) = \ell_6 \cap \ell_{16} = b_1 \cap c_{16}$
$P_{51622} = (37, 37, 11, 1) = \ell_7 \cap \ell_{12} = b_2 \cap c_{12}$
$P_{153996} = (11, 37, 36, 1) = \ell_7 \cap \ell_{17} = b_2 \cap c_{23}$
$P_{10635} = (10, 37, 1, 1) = \ell_7 \cap \ell_{19} = b_2 \cap c_{25}$
$P_{6531} = (1, 37, 0, 1) = \ell_7 \cap \ell_{20} = b_2 \cap c_{26}$
$P_{197323} = (10, 10, 47, 1) = \ell_8 \cap \ell_{13} = b_3 \cap c_{13}$
$P_{8934} = (37, 10, 1, 1) = \ell_8 \cap \ell_{21} = b_3 \cap c_{34}$
$P_{49858} = (1, 10, 11, 1) = \ell_8 \cap \ell_{22} = b_3 \cap c_{35}$
$P_{193264} = (47, 10, 46, 1) = \ell_8 \cap \ell_{23} = b_3 \cap c_{36}$
$P_{154607} = (46, 46, 36, 1) = \ell_{10} \cap \ell_{15} = b_5 \cap c_{15}$
$P_{199618} = (1, 46, 47, 1) = \ell_{10} \cap \ell_{22} = b_5 \cap c_{35}$
$P_{52208} = (47, 46, 11, 1) = \ell_{10} \cap \ell_{24} = b_5 \cap c_{45}$
$P_{48102} = (37, 46, 10, 1) = \ell_{10} \cap \ell_{26} = b_5 \cap c_{56}$
$P_5 = (1, 1, 0, 0) = \ell_{11} \cap \ell_{16} = b_6 \cap c_{16}$
$P_{40} = (36, 1, 0, 0) = \ell_{11} \cap \ell_{23} = b_6 \cap c_{36}$
$P_{50} = (46, 1, 0, 0) = \ell_{11} \cap \ell_{25} = b_6 \cap c_{46}$
$P_{51} = (47, 1, 0, 0) = \ell_{11} \cap \ell_{26} = b_6 \cap c_{56}$
$P_{199077} = (36, 37, 47, 1) = \ell_{12} \cap \ell_{21} = c_{12} \cap c_{34}$
$P_{153986} = (1, 37, 36, 1) = \ell_{12} \cap \ell_{22} = c_{12} \cap c_{35}$
$P_{194955} = (10, 37, 46, 1) = \ell_{12} \cap \ell_{23} = c_{12} \cap c_{36}$
$P_{10671} = (46, 37, 1, 1) = \ell_{12} \cap \ell_{24} = c_{12} \cap c_{45}$
$P_{158128} = (47, 37, 37, 1) = \ell_{12} \cap \ell_{25} = c_{12} \cap c_{46}$
$P_{47500} = (11, 37, 10, 1) = \ell_{12} \cap \ell_{26} = c_{12} \cap c_{56}$
$P_{49904} = (47, 10, 11, 1) = \ell_{13} \cap \ell_{19} = c_{13} \cap c_{25}$
$P_{4803} = (1, 10, 0, 1) = \ell_{13} \cap \ell_{20} = c_{13} \cap c_{26}$
$P_{152293} = (36, 10, 36, 1) = \ell_{13} \cap \ell_{24} = c_{13} \cap c_{45}$
$P_{156364} = (11, 10, 37, 1) = \ell_{13} \cap \ell_{25} = c_{13} \cap c_{46}$
$P_{49218} = (1, 0, 11, 1) = \ell_{14} \cap \ell_{17} = c_{14} \cap c_{23}$
$P_{196674} = (1, 0, 47, 1) = \ell_{14} \cap \ell_{19} = c_{14} \cap c_{25}$
$P_{4163} = (1, 0, 0, 1) = \ell_{14} \cap \ell_{20} = c_{14} \cap c_{26}$
$P_{8259} = (1, 0, 1, 1) = \ell_{14} \cap \ell_{22} = c_{14} \cap c_{35}$
$P_{192578} = (1, 0, 46, 1) = \ell_{14} \cap \ell_{23} = c_{14} \cap c_{36}$
$P_{45122} = (1, 0, 10, 1) = \ell_{14} \cap \ell_{26} = c_{14} \cap c_{56}$
$P_{11238} = (37, 46, 1, 1) = \ell_{15} \cap \ell_{17} = c_{15} \cap c_{23}$
$P_{7107} = (1, 46, 0, 1) = \ell_{15} \cap \ell_{20} = c_{15} \cap c_{26}$
$P_{52172} = (11, 46, 11, 1) = \ell_{15} \cap \ell_{21} = c_{15} \cap c_{34}$
$P_{158667} = (10, 46, 37, 1) = \ell_{15} \cap \ell_{25} = c_{15} \cap c_{46}$
$P_{2408} = (37, 36, 1, 0) = \ell_{16} \cap \ell_{17} = c_{16} \cap c_{23}$
$P_{781} = (10, 11, 1, 0) = \ell_{16} \cap \ell_{19} = c_{16} \cap c_{25}$
$P_{2471} = (36, 37, 1, 0) = \ell_{16} \cap \ell_{21} = c_{16} \cap c_{34}$
$P_{3058} = (47, 46, 1, 0) = \ell_{16} \cap \ell_{24} = c_{16} \cap c_{45}$
$P_{199691} = (10, 47, 47, 1) = \ell_{17} \cap \ell_{24} = c_{23} \cap c_{45}$
$P_{155823} = (46, 1, 37, 1) = \ell_{17} \cap \ell_{25} = c_{23} \cap c_{46}$
$P_{47461} = (36, 36, 10, 1) = \ell_{17} \cap \ell_{26} = c_{23} \cap c_{56}$
$P_{153967} = (46, 36, 36, 1) = \ell_{19} \cap \ell_{21} = c_{25} \cap c_{34}$
$P_{193292} = (11, 11, 46, 1) = \ell_{19} \cap \ell_{23} = c_{25} \cap c_{36}$
$P_{158757} = (36, 47, 37, 1) = \ell_{19} \cap \ell_{25} = c_{25} \cap c_{46}$
$P_{7171} = (1, 47, 0, 1) = \ell_{20} \cap \ell_{21} = c_{26} \cap c_{34}$
$P_{4227} = (1, 1, 0, 1) = \ell_{20} \cap \ell_{22} = c_{26} \cap c_{35}$
$P_{4867} = (1, 11, 0, 1) = \ell_{20} \cap \ell_{24} = c_{26} \cap c_{45}$
$P_{45872} = (47, 11, 10, 1) = \ell_{21} \cap \ell_{26} = c_{34} \cap c_{56}$
$P_{158018} = (1, 36, 37, 1) = \ell_{22} \cap \ell_{25} = c_{35} \cap c_{46}$
$P_{192678} = (37, 1, 46, 1) = \ell_{23} \cap \ell_{24} = c_{36} \cap c_{45}$

Single Points

The surface has 1524 single points:
Too many to print.

Points on surface but on no line

The surface has 2912 points not on any line:
Too many to print.

Line Intersection Graph

		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
		a_1	a_2	a_3	a_4	a_5	a_6	b_1	b_2	b_3	b_4	b_5	b_6	c_{12}	c_{13}	c_{14}	c_{15}	c_{16}	c_{23}	c_{24}	c_{25}	c_{26}	c_{34}	c_{35}	c_{36}	c_{45}	c_{46}	c_{56}
0	a_1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1	a_2	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0
2	a_3	0	0	0	0	0	0	1	1	0	1	1	1	0	1	0	0	0	1	0	0	0	1	1	1	0	0	0
3	a_4	0	0	0	0	0	0	1	1	1	0	1	1	0	0	1	0	0	0	1	0	0	1	0	0	1	1	0
4	a_5	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	1	0	0	0	1	0	0	1	0	1	0	1
5	a_6	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1
6	b_1	0	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
7	b_2	1	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0
8	b_3	1	1	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	1	1	0	0	0
9	b_4	1	1	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	1	0
10	b_5	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	1
11	b_6	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1
12	c_{12}	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
13	c_{13}	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	1	1
14	c_{14}	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0	0	1
15	c_{15}	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	1	1	0	1	0	1	0
16	c_{16}	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	1	0	1	1	0	1	0	0
17	c_{23}	0	1	1	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	1
18	c_{24}	0	1	0	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	0	0	1	1	0	0	1
19	c_{25}	0	1	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0	0	0	1	0	1	0	1	0
20	c_{26}	0	1	0	0	0	1	0	1	0	0	0	1	0	1	1	1	0	0	0	0	0	1	1	0	1	0	0
21	c_{34}	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	1	1	0	0	1	1	0	0	0	0	0	1
22	c_{35}	0	0	1	0	1	0	0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	1	0
23	c_{36}	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	1	0	0
24	c_{45}	0	0	0	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0
25	c_{46}	0	0	0	1	0	1	0	0	0	1	0	1	1	1	0	1	0	1	0	1	0	0	1	0	0	0	0
26	c_{56}	0	0	0	0	1	1	0	0	0	0	1	1	1	1	1	0	0	1	1	0	0	1	0	0	0	0	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}
in point	P_{78}	P_{104}	P_2	P_{77}	P_0	P_{113}	P_{114}	P_2	P_{103}	P_{68}

Line 1 intersects

Line	ℓ_6	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}
in point	P_{6530}	P_{4802}	P_3	P_{7106}	P_1	P_{6530}	P_{4802}	P_3	P_{7106}	P_1

Line 2 intersects

Line	ℓ_6	ℓ_7	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{13}	ℓ_{17}	ℓ_{21}	ℓ_{22}	ℓ_{23}
in point	P_{192651}	P_{194981}	P_{192577}	P_{195532}	P_{14}	P_{193254}	P_{193328}	P_{192577}	P_{195586}	P_{194927}

Line 3 intersects

Line	ℓ_6	ℓ_7	ℓ_8	ℓ_{10}	ℓ_{11}	ℓ_{14}	ℓ_{18}	ℓ_{21}	ℓ_{24}	ℓ_{25}
in point	P_{158768}	P_{158081}	P_{156399}	P_{158693}	P_{15}	P_{155714}	P_{158081}	P_{155787}	P_{158028}	P_{156454}

Line 4 intersects

Line	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{15}	ℓ_{19}	ℓ_{22}	ℓ_{24}	ℓ_{26}
in point	P_{47436}	P_{47535}	P_{45797}	P_{45121}	P_{41}	P_{48112}	P_{45222}	P_{45826}	P_{45121}	P_{48139}

Line 5 intersects

Line	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{16}	ℓ_{20}	ℓ_{23}	ℓ_{25}	ℓ_{26}
in point	P_{49958}	P_{199088}	P_{152268}	P_{155713}	P_{11211}	P_{718}	P_{6467}	P_{195621}	P_{155713}	P_{45231}

Line 6 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}
in point	P_{6530}	P_{192651}	P_{158768}	P_{47436}	P_{49958}	P_{6530}	P_{8943}	P_{151618}	P_{199653}	P_{3121}

Line 7 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_{12}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}
in point	P_{78}	P_{194981}	P_{158081}	P_{47535}	P_{199088}	P_{51622}	P_{153996}	P_{158081}	P_{10635}	P_{6531}

Line 8 intersects

Line	ℓ_0	ℓ_1	ℓ_3	ℓ_4	ℓ_5	ℓ_{13}	ℓ_{17}	ℓ_{21}	ℓ_{22}	ℓ_{23}
in point	P_{104}	P_{4802}	P_{156399}	P_{45797}	P_{152268}	P_{197323}	P_{4802}	P_{8934}	P_{49858}	P_{193264}

Line 9 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_4	ℓ_5	ℓ_{14}	ℓ_{18}	ℓ_{21}	ℓ_{24}	ℓ_{25}
in point	P_2	P_3	P_{192577}	P_{45121}	P_{155713}	P_2	P_3	P_{192577}	P_{45121}	P_{155713}

Line 10 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_5	ℓ_{15}	ℓ_{19}	ℓ_{22}	ℓ_{24}	ℓ_{26}
in point	P_{77}	P_{7106}	P_{195532}	P_{158693}	P_{11211}	P_{154607}	P_{7106}	P_{199618}	P_{52208}	P_{48102}

Line 11 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_{16}	ℓ_{20}	ℓ_{23}	ℓ_{25}	ℓ_{26}
in point	P_0	P_1	P_{14}	P_{15}	P_{41}	P_5	P_1	P_{40}	P_{50}	P_{51}

Line 12 intersects

Line	ℓ_0	ℓ_1	ℓ_6	ℓ_7	ℓ_{21}	ℓ_{22}	ℓ_{23}	ℓ_{24}	ℓ_{25}	ℓ_{26}
in point	P_{113}	P_{6530}	P_{6530}	P_{51622}	P_{199077}	P_{153986}	P_{194955}	P_{10671}	P_{158128}	P_{47500}

Line 13 intersects

Line	ℓ_0	ℓ_2	ℓ_6	ℓ_8	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{24}	ℓ_{25}	ℓ_{26}
in point	P_{114}	P_{193254}	P_{8943}	P_{197323}	P_{45761}	P_{49904}	P_{4803}	P_{152293}	P_{156364}	P_{45761}

Line 14 intersects

Line	ℓ_0	ℓ_3	ℓ_6	ℓ_9	ℓ_{17}	ℓ_{19}	ℓ_{20}	ℓ_{22}	ℓ_{23}	ℓ_{26}
in point	P_2	P_{155714}	P_{151618}	P_2	P_{49218}	P_{196674}	P_{4163}	P_{8259}	P_{192578}	P_{45122}

Line 15 intersects

Line	ℓ_0	ℓ_4	ℓ_6	ℓ_{10}	ℓ_{17}	ℓ_{18}	ℓ_{20}	ℓ_{21}	ℓ_{23}	ℓ_{25}
in point	P_{103}	P_{48112}	P_{199653}	P_{154607}	P_{11238}	P_{195521}	P_{7107}	P_{52172}	P_{195521}	P_{158667}

Line 16 intersects

Line	ℓ_0	ℓ_5	ℓ_6	ℓ_{11}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{21}	ℓ_{22}	ℓ_{24}
in point	P_{68}	P_{718}	P_{3121}	P_5	P_{2408}	P_{131}	P_{781}	P_{2471}	P_{131}	P_{3058}

Line 17 intersects

Line	ℓ_1	ℓ_2	ℓ_7	ℓ_8	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{24}	ℓ_{25}	ℓ_{26}
in point	P_{4802}	P_{193328}	P_{153996}	P_{4802}	P_{49218}	P_{11238}	P_{2408}	P_{199691}	P_{155823}	P_{47461}

Line 18 intersects

Line	ℓ_1	ℓ_3	ℓ_7	ℓ_9	ℓ_{13}	ℓ_{15}	ℓ_{16}	ℓ_{22}	ℓ_{23}	ℓ_{26}
in point	P_3	P_{158081}	P_{158081}	P_3	P_{45761}	P_{195521}	P_{131}	P_{131}	P_{195521}	P_{45761}

Line 19 intersects

Line	ℓ_1	ℓ_4	ℓ_7	ℓ_{10}	ℓ_{13}	ℓ_{14}	ℓ_{16}	ℓ_{21}	ℓ_{23}	ℓ_{25}
in point	P_{7106}	P_{45222}	P_{10635}	P_{7106}	P_{49904}	P_{196674}	P_{781}	P_{153967}	P_{193292}	P_{158757}

Line 20 intersects

Line	ℓ_1	ℓ_5	ℓ_7	ℓ_{11}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{21}	ℓ_{22}	ℓ_{24}
in point	P_1	P_{6467}	P_{6531}	P_1	P_{4803}	P_{4163}	P_{7107}	P_{7171}	P_{4227}	P_{4867}

Line 21 intersects

Line	ℓ_2	ℓ_3	ℓ_8	ℓ_9	ℓ_{12}	ℓ_{15}	ℓ_{16}	ℓ_{19}	ℓ_{20}	ℓ_{26}
in point	P_{192577}	P_{155787}	P_{8934}	P_{192577}	P_{199077}	P_{52172}	P_{2471}	P_{153967}	P_{7171}	P_{45872}

Line 22 intersects

Line	ℓ_2	ℓ_4	ℓ_8	ℓ_{10}	ℓ_{12}	ℓ_{14}	ℓ_{16}	ℓ_{18}	ℓ_{20}	ℓ_{25}
in point	P_{195586}	P_{45826}	P_{49858}	P_{199618}	P_{153986}	P_{8259}	P_{131}	P_{131}	P_{4227}	P_{158018}

Line 23 intersects

Line	ℓ_2	ℓ_5	ℓ_8	ℓ_{11}	ℓ_{12}	ℓ_{14}	ℓ_{15}	ℓ_{18}	ℓ_{19}	ℓ_{24}
in point	P_{194927}	P_{195621}	P_{193264}	P_{40}	P_{194955}	P_{192578}	P_{195521}	P_{195521}	P_{193292}	P_{192678}

Line 24 intersects

Line	ℓ_3	ℓ_4	ℓ_9	ℓ_{10}	ℓ_{12}	ℓ_{13}	ℓ_{16}	ℓ_{17}	ℓ_{20}	ℓ_{23}
in point	P_{158028}	P_{45121}	P_{45121}	P_{52208}	P_{10671}	P_{152293}	P_{3058}	P_{199691}	P_{4867}	P_{192678}

Line 25 intersects

Line	ℓ_3	ℓ_5	ℓ_9	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{15}	ℓ_{17}	ℓ_{19}	ℓ_{22}
in point	P_{156454}	P_{155713}	P_{155713}	P_{50}	P_{158128}	P_{156364}	P_{158667}	P_{155823}	P_{158757}	P_{158018}

Line 26 intersects

Line	ℓ_4	ℓ_5	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{17}	ℓ_{18}	ℓ_{21}
in point	P_{48139}	P_{45231}	P_{48102}	P_{51}	P_{47500}	P_{45761}	P_{45122}	P_{47461}	P_{45761}	P_{45872}

The surface has 4545 points:
Too many to print.