

# 1 BLT set 4 over GF(47)

Points on the quadric  $x_0^2 + x_1x_2 + x_3x_4$ :

$$P_1 = (0, 1, 0, 0, 0)$$

$$P_2 = (0, 0, 1, 0, 0)$$

$$P_3 = (0, 1, 28, 46, 28)$$

$$P_4 = (0, 1, 7, 23, 14)$$

$$P_5 = (0, 1, 21, 41, 27)$$

$$P_6 = (1, 15, 22, 25, 30)$$

$$P_7 = (1, 38, 10, 12, 27)$$

$$P_8 = (1, 3, 6, 38, 23)$$

$$P_9 = (1, 6, 21, 2, 7)$$

$$P_{10} = (1, 5, 11, 40, 8)$$

$$P_{11} = (1, 15, 26, 19, 19)$$

$$P_{12} = (1, 38, 29, 21, 37)$$

$$P_{13} = (1, 5, 5, 1, 21)$$

$$P_{14} = (1, 2, 27, 1, 39)$$

$$P_{15} = (1, 35, 20, 38, 10)$$

$$P_{16} = (1, 7, 9, 23, 34)$$

$$P_{17} = (1, 31, 11, 22, 40)$$

$$P_{18} = (1, 19, 35, 25, 26)$$

$$P_{19} = (1, 40, 43, 3, 6)$$

$$P_{20} = (1, 42, 3, 35, 38)$$

$$P_{21} = (1, 25, 17, 31, 9)$$

$$P_{22} = (1, 46, 43, 20, 35)$$

$$P_{23} = (1, 37, 14, 22, 17)$$

$$P_{24} = (1, 21, 12, 21, 26)$$

$$P_{25} = (1, 7, 8, 13, 39)$$

$$P_{26} = (1, 8, 18, 2, 45)$$

$$P_{27} = (1, 22, 30, 3, 46)$$

$$P_{28} = (1, 24, 1, 29, 4)$$

$$P_{29} = (1, 24, 7, 28, 46)$$

$$P_{30} = (1, 31, 39, 10, 20)$$

$$P_{31} = (1, 34, 25, 42, 1)$$

$$P_{32} = (1, 36, 28, 41, 35)$$

$$P_{33} = (1, 23, 40, 31, 37)$$

$$P_{34} = (1, 31, 15, 17, 3)$$

$$P_{35} = (1, 12, 32, 32, 10)$$

$$P_{36} = (1, 33, 39, 19, 46)$$

$$P_{37} = (1, 28, 42, 8, 35)$$

$$P_{38} = (1, 46, 40, 10, 18)$$

$$P_{39} = (1, 17, 24, 35, 38)$$

$$P_{40} = (1, 31, 11, 23, 26)$$

$$P_{41} = (1, 18, 21, 31, 9)$$

$$P_{42} = (1, 38, 43, 15, 32)$$

$$P_{43} = (1, 26, 43, 45, 19)$$

$$P_{44} = (1, 2, 28, 23, 20)$$

$$P_{45} = (1, 28, 14, 37, 44)$$

$$P_{46} = (1, 29, 22, 12, 29)$$

$$P_{47} = (1, 20, 22, 26, 21)$$

$$P_{48} = (1, 4, 28, 37, 16)$$

Stabilizer of order 2 is generated by:

$$g_1 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

The induced group has order 2 and is generated by:

$$g_1 = (1, 19)(2, 7)(3, 8)(4, 47)(5, 15)(6, 31)(9, 40)(10, 48)(11, 39)(12, 25)(14, 29)(16, 37)(17, 46)(18, 28)(20, 36)(21, 24)(22, 32)(23, 34)(26, 43)(27, 33)(30, 42)(38, 44)(41, 45)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 19)(2, 7)(3, 8)(4, 47)(5, 15)(6, 31)(9, 40)(10, 48)(11, 39)(12, 25)(14, 29)(16, 37)(17, 46)(18, 28)(20, 36)(21, 24)(22, 32)(23, 34)(26, 43)(27, 33)(30, 42)(38, 44)(41, 45)$$

and now the elements themselves:  $a_1 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

There are 25 orbits on the BLT set.

The orbit length are  $[2^{23}, 1^2]$

The orbits are:

$$O_0 = \{1, 19\} \text{ (length 2)}$$

$$O_1 = \{2, 7\} \text{ (length 2)}$$

$$O_2 = \{3, 8\} \text{ (length 2)}$$

$$O_3 = \{4, 47\} \text{ (length 2)}$$

$$O_4 = \{5, 15\} \text{ (length 2)}$$

$$O_5 = \{6, 31\} \text{ (length 2)}$$

$$O_6 = \{9, 40\} \text{ (length 2)}$$

$$O_7 = \{10, 48\} \text{ (length 2)}$$

$$O_8 = \{11, 39\} \text{ (length 2)}$$

$$O_9 = \{12, 25\} \text{ (length 2)}$$

$$O_{10} = \{13\} \text{ (length 1)}$$

$$O_{11} = \{14, 29\} \text{ (length 2)}$$

$$O_{12} = \{16, 37\} \text{ (length 2)}$$

$$O_{13} = \{17, 46\} \text{ (length 2)}$$

$$O_{14} = \{18, 28\} \text{ (length 2)}$$

$$O_{15} = \{20, 36\} \text{ (length 2)}$$

$$O_{16} = \{21, 24\} \text{ (length 2)}$$

$$O_{17} = \{22, 32\} \text{ (length 2)}$$

$$O_{18} = \{23, 34\} \text{ (length 2)}$$

$$O_{19} = \{26, 43\} \text{ (length 2)}$$

$$O_{20} = \{27, 33\} \text{ (length 2)}$$

$$O_{21} = \{30, 42\} \text{ (length 2)}$$

$$O_{22} = \{35\} \text{ (length 1)}$$

$$O_{23} = \{38, 44\} \text{ (length 2)}$$

$$O_{24} = \{41, 45\} \text{ (length 2)}$$

The actions induced on the orbits are:

Induced action on orbit  $O_0 = \{1, 19\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_1 = \{2, 7\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_2 = \{3, 8\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_3 = \{4, 47\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_4 = \{5, 15\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_5 = \{6, 31\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_6 = \{9, 40\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_7 = \{10, 48\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_8 = \{11, 39\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_9 = \{12, 25\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{10} = \{13\}$  (length 1)

The induced group has order 1 and is generated by:

$$g_1 = \text{id}$$

group order is small, so we list all elements  $a_1 = \text{id}$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

Kernel has order 2 and is generated by:

$$b_1 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

The kernel has 53064 orbits on the quadric.

The orbit length are  $[2^{53016}, 1^{48}]$

Induced action on orbit  $O_{11} = \{14, 29\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{12} = \{16, 37\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{13} = \{17, 46\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{14} = \{18, 28\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{15} = \{20, 36\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{16} = \{21, 24\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{17} = \{22, 32\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{18} = \{23, 34\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{19} = \{26, 43\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{20} = \{27, 33\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{21} = \{30, 42\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{22} = \{35\}$  (length 1)

The induced group has order 1 and is generated by:

$g_1 = \text{id}$

group order is small, so we list all elements  $a_1 = \text{id}$

and now the elements themselves:  $a_1 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$

Kernel has order 2 and is generated by:

$$b_1 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

The kernel has 53064 orbits on the quadric.

The orbit length are  $[2^{53016}, 1^{48}]$

Induced action on orbit  $O_{23} = \{38, 44\}$  (length 2)

The induced group has order 2 and is generated by:

$g_1 = (1, 2)$

group order is small, so we list all elements  $a_1 = \text{id}$

$a_2 = (1, 2)$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by:

Induced action on orbit  $O_{24} = \{41, 45\}$  (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

group order is small, so we list all elements  $a_1 = \text{id}$

$$a_2 = (1, 2)$$

and now the elements themselves:  $a_1 =$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 26 & 26 & 30 & 44 & 15 \\ 15 & 36 & 34 & 45 & 43 \\ 13 & 24 & 36 & 15 & 22 \\ 31 & 22 & 43 & 22 & 18 \\ 22 & 15 & 45 & 5 & 22 \end{pmatrix}$$

Kernel has order 1 and is generated by: