

$M = \{(1,3), (1,7), (5,7), (7,5)\}$
 $a \circ a = (id)$ $a_i b_i id \in \langle M \rangle$
 $a \circ b = (1,3) \circ (7,7) \circ (5,7) \circ (7,5) = (1,5) \circ (7,6) \circ (7,2)$
 $a \circ b \in M$ $b = (a \circ b)$
 $(a \circ b)^2 \in M$ $(b \circ a) \circ b$
 $(a \circ b)^3 \in M$ $(a \circ b)^4$
 $b \circ a = (5,7) \circ (7,5) \circ (1,5) \circ (7,7) = (1,7) \circ (7,5) = (a \circ b)^4$
 $(a \circ b)^2 \circ a$ $(a \circ b)^3 \circ a$ $(a \circ b)^4 \circ a$
 $(a \circ b)^5 \circ a$
 $(a \circ b)^6 \circ a = b \circ a \circ a$
 $a_i b_i id, a \circ b, (a \circ b)^2, (a \circ b)^3, (a \circ b)^4$
 $(a \circ b)^5 \circ a, (a \circ b)^6 \circ a, a \circ b \circ a$

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$G = GL_2(\mathbb{Z}_2) = \left\langle \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix} \right\rangle$
 $\begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix} \notin G$ $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \cdot \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
 $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \in G$ $\begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix} \cdot \begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 1 & 0 \end{pmatrix}$
 $\begin{pmatrix} 1 & 1 \\ 1 & 0 \end{pmatrix} \in G$ $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \cdot \begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$
 $\begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix} \in G$ $\begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix} \cdot \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix}$
 $\begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix} \in G$

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