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It is OK to post the homework in your web-site

1. a. $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 7 & 1 & 2 & 6 & 9 & 5 & 3 & 8 & 4 \end{pmatrix}$

b. $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 8 & 6 & 1 & 5 & 3 & 2 & 7 & 4 & 9 \end{pmatrix}$

2. $\pi = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 2 & 1 \end{pmatrix}$, $\pi^2 = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 5 & 2 & 1 & 4 & 3 \end{pmatrix}$,

$\pi^3 = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 1 & 4 & 3 & 2 & 5 \end{pmatrix}$, $\pi^4 = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 2 & 5 & 4 & 1 \end{pmatrix}$,

$\pi^5 = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 5 & 4 & 1 & 2 & 3 \end{pmatrix}$ $\pi^6 = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 1 & 2 & 3 & 4 & 5 \end{pmatrix} = \text{Identity permutation.}$

3. $\begin{pmatrix} 1 & 4 & 6 \\ 4 & 6 & 1 \end{pmatrix} \begin{pmatrix} 2 & 5 & 8 & 3 & 7 & 9 \\ 5 & 8 & 3 & 7 & 9 & 2 \end{pmatrix}$

$\text{lcm}(3, 6) = 6$

4. $\begin{pmatrix} 1 & 9 \\ 9 & 1 \end{pmatrix} \begin{pmatrix} 2 & 4 & 7 \\ 4 & 7 & 2 \end{pmatrix} \begin{pmatrix} 3 & 5 & 6 & 8 & 10 \\ 5 & 6 & 8 & 10 & 3 \end{pmatrix}$

$\text{lcm}(2, 3, 5) = 30$

5. $\begin{pmatrix} 4 & 9 & 5 & 8 & 6 & 7 & 2 & 1 & 10 & 3 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \end{pmatrix}$

Answer: $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 8 & 7 & 10 & 1 & 3 & 5 & 6 & 4 & 2 & 9 \end{pmatrix}$