Nabhanya Neb Homework 14 * you can post *

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

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

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

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

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

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

$\pi^6 = \begin{matrix} 1 & 2 & 3 & 4 & 5 \\ 1 & 2 & 3 & 4 & 5 \end{matrix}$ = identity permutation

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

(146)(258379)

lcm(3,6) = $\boxed{12}$

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

(19)(247)(35681 0)
2 3 5
lcm(2, 3, 5) = 30

π^i = identity permutation if $i = 30$

⑤ π^{-1} :

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

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

⑥ {1, 2, 3}: NONE (0)
{1, 3, 2 3: positions: (2, 3) values: (3, 2) (1)
{2, 1, 3 3: positions: (1, 2) values (2, 1) (1)
{2, 3, 1, }: positions: (1, 3), (2, 3) values: (2, 1), (3, 2) (2)
{3, 1, 2 3: positions (1, 2), (1, 3) vals: (3, 1), (3, 2) (2)
{3, 2, 1 3: pos: (1, 2), (1, 3), (2, 3) vals: (3, 2), (3, 1), (2, 1) (3)

⑦ 1 5 2 3 7 4 6
0 + 3 + 0 + 0 + 2 + 0 + 0 = 5 inversions

* a[i] > a[j]
where i < j