

SOLUTIONS

2994

1.  $\{1, 5, 2\}$   $\{3\}$   $\{4, 6\}$

2.  $\{1, 5, 8, 7\}$   $\{2, 6, 3\}$   $\{4\}$

3.  $\{1, 2, 3, 5, 4\}$   $\{6\}$   $\{7, 8\}$

4.  $\mathbb{Z}$

5.  $\{\dots -3, -1, 1, 3, \dots\}$   $\{\dots -2, 0, 2, 4, \dots\}$

6.  $\{\dots -6, -3, 0, 3, 6, \dots\}$

$\{\dots -5, -2, 1, 4, \dots\}$

$\{\dots -4, -1, 2, 5, 8, \dots\}$

7.  $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 4 & 1 & 3 & 5 & 8 & 6 & 2 & 7 \end{pmatrix} = (145872)(3/6)$

8.  $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 3 & 7 & 2 & 8 & 5 & 4 & 1 & 6 \end{pmatrix} = (1327)(486)(5)$

9.  $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 5 & 4 & 3 & 7 & 8 & 6 & 2 & 1 \end{pmatrix} = (158)(247)(3)(6)$

10.  $(18)(2)(364)(57)$

aka

$(18)(34)(36)(57)$

11.  $(134)(26)(587)$

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$(14)(13)(26)(57)(58)$

12.  $(13478652) = (12)(15)(16)(18)(17)(14)(13)$

13. 9. 4

b. order of an  $n$ -cycle is  $n$

c. order  $\sigma = 6$

order  $\tau = 4$

d. #10 order is 6

#11 order is 6

#12 order is 8

e. If  $\sigma$  is a product of disjoint cycles then the order of  $\sigma$  is the lcm of the cycles.