Assignment 3

MA08 Applied Algebra   Deadline 05:00 PM, Wednesday, 20190626

1. Determine whether the binary operation $\circ$ gives a group structure on the given set.

    (a) Let $\circ$ be defined on $\mathbb{Z}$ by letting $a \circ b = a \cdot b$. (Known that $\mathbb{Z}$ is closed under $\circ$.)

    (b) Let $\circ$ be defined on $2\mathbb{Z} = \{2n \mid n \in \mathbb{Z}\}$ by letting $a \circ b = a + b$.

2. Use the cycle notation $(i_1\ i_2\ ...)$ to express the given permutations. (Hint: Definition 3.9 and Theorem 3.4)

    (a) $\pi = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 2 & 5 & 4 & 1 \end{pmatrix}$

    (b) $\alpha = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 2 & 1 & 3 & 6 & 5 & 7 & 4 \end{pmatrix}$

3. (a) Use cycle notation to rewrite the set of S_3 in Example 3.7 of Lecture 3 (Page 21). (Please use e to express identity permutation.)

    (b) The permutation $(1\ 3\ 2)$ in S_3 of sub-question (a) is an even permutation or odd permutation?

4. Review Example 3.6 and Example 3.7. Make sure that you can clearly understand them.

    Notice: Please write Your Name and Student ID when you submit.