Assignment 5

MA08 Applied Algebra Deadline 05:00 PM, Wednesday, 20190703

1. Review Example 5.1 and
   (a) Find all cosets of the subgroup $4\mathbb{Z}$ of $\mathbb{Z}$.
   (b) Find all cosets of the subgroup $4\mathbb{Z}$ of $2\mathbb{Z}$.
2. Prove that "Let H and L be subgroups of a finite group G such that $L \subset H \subset G$. Then $[G : L] = [G : H][H : L]$." (Hint: Lagrange's Theorem.)
3. Find the order of the quotient group $\mathbb{Z}_6/\langle 3\rangle$.
4. The trivial subgroup $N = \{0\}$ of $\mathbb{Z}$ is a normal subgroup. Find $\mathbb{Z}/\{0\}$. (Hint: $\mathbb{Z}/\{0\}$ is a set of all left cosets.)
5. For the subgroup $(\mathbb{Z}, +)$ of the group $(\mathbb{R}, +)$, define $r \in [0, 1)$ and $r \in \mathbb{R}$, find $\mathbb{R}/\mathbb{Z}$.

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