Abstract Algebra
Problem Set 10

1. Exhibit four nonisomorphic groups of order 66.

2. Prove or disprove that $\mathbb{Z}_4 \times \mathbb{Z}_{15}$ is isomorphic to $\mathbb{Z}_6 \times \mathbb{Z}_{10}$.

3. Find a permutation β such that $\beta^2 = (13579)(268)$.

4. Find a subgroup of order 6 in $U(450)$.

5. Suppose that G is a finite Abelian group that does not contain a subgroup isomorphic to $\mathbb{Z}_p \times \mathbb{Z}_p$ for any prime p. Prove that G is cyclic.