Exercise 1
(i) Find all injective homomorphisms from \( \mathbb{Z} \) and the group of all numbers \( 2^n, n \in \mathbb{Z} \).
(ii) Find all surjective homomorphisms from \( \mathbb{Z}_6 \) to \( \mathbb{Z}_3 \).

Exercise 2
(i) Determine all cosets in \( \mathbb{Z}_{10} \) modulo the subgroup \( \langle [5] \rangle \) generated by \([5]\).
(ii) Determine left and right cosets in \( S_3 \) modulo the subgroup \( H \) generated by the cycle \((23)\).
(iii) If \( H \subset G \) is a subgroup, prove that \( Hg = H \) if and only if \( g \in H \).

Exercise 3
Prove or disprove:
(i) Composition of two group homomorphisms is a group homomorphism.
(ii) Homomorphic image of a cyclic group is cyclic.