1. Let E be the identity of a group G, a and b be any two elements in the group, a^{-1} and b^{-1} be respectively the inverses of a and b. Using the definition of a group, show that

   (a) If $ca = a$, then $c = E$;

   (b) If $ca = E$, then $c = a^{-1}$;

   (c) The inverse of (ab) is $b^{-1}a^{-1}$.

2. Show that the set of nonzero complex numbers is a group under the ordinary multiplication.

3. Show that there is only one group of order three. Using a step-by-step procedure, construct the multiplication table for the group.

4. Show that a group must be an Abelian group if the order of any element except the identity in the group is 2.

5. Show that every subgroup of a cyclic group is also cyclic.