Assignment I

1. Define group.
2. Give the following examples:
   1. A finite group which is not commutative.
   2. A set with associative binary operation and an identity, but which is not a group.
3. (Cancellation law) For elements x, y, z of a group G, show that $xy = xz$ implies $y = z$.
4. Let S_3 be the set of all bijections (permutations) of the set $\{1, 2, 3\}$. Show that S_3 is a group, with composition of functions as the binary operation. Find an element in S_3 of order 3.
5. Let G be a group and $x \in G$ be an element. Show that the map $L : G \to G$, defined by

$$L(y) = x \cdot y$$

is a bijection.