# Assignment 4 - Normal subgroups, quotient groups

1. If $G$ is a finite group, show that for any $a \in G$, $a^{|G|} = e$.
2. Let $G$ be a group with $|G| = p$ where $p$ is a prime number. Show that $G$ is cyclic.
3. Let $p$ be a prime number and $a$ an integer. Show that $a^p \equiv a \mod p$
4. Show that every subgroup of an abelian group is normal.
5. Show that every normal subgroup is of $G$ is kernel of some homomorphism from $G$.