1. Find all subgroups of $\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2$. Hint: there are 16 counting the whole group and the one element group.

Solution:

2. Let $G$ be a group and let $D = \{(a, a) : a \in G\}$. Show that $D$ is a subgroup of $G \times G$. Also show that $D$ is a normal subgroup of $G \times G$ if and only if $G$ is abelian.

Solution:

3. Let $G$ be an abelian group and let $p$ be a prime. Show that $\{a^p : a \in G\}$ is a subgroup.

Solution: