MODERN ALGEBRA 1 - FALL 2017 - ASSIGNMENT 5

1) If G is an abelian group, show that the set of elements of odd order form a subgroup.

2) Suppose $C = \{z \in \mathbb{C} : z = e^{2\pi i q} \text{ where } q \in \mathbb{Q}\}$. Show $C \cong \mathbb{Q}/\mathbb{Z}$.

3) Given $H \leq G$, $G = \langle g \rangle$, show that H is fully invariant.

4) Prove or disprove: If $N \trianglelefteq G$ and G/N is abelian, then G is abelian.

5) Given group G, show that $\{x^{-1}y^{-1}xy : x, y \in G\} \leq G$.

6) Show that if $G \geq H \geq \{x^{-1}y^{-1}xy : x, y \in G\}$, then $H \trianglelefteq G$.