

Math 251: Foundations of Advanced Mathematics

Written Problems #5

Prove the following statements.

1. Let G be a finite group, and $a \in G$. There exists a natural number n such that $a^n = e$.
2. Let G be a group with binary operation $*$, and let

$$Z = \{a \in G \mid a * x = x * a \text{ for all } x \in G\}.$$

Then Z is a group with binary operation $*$.

3. Let (s_n) be a sequence of real numbers. If (s_n) is increasing, then every subsequence of (s_n) is increasing.