Algebra

Chapter 1

Groups

1.1 Groups

Definition 1.1. A nonempty set G and a binary operation $\star$ form a **group** if the following conditions hold.

1. For any $a, b \in G$, $a \star b \in G$.

2. For any $a, b, c \in G$, $(a \star b) \star c = a \star (b \star c)$.

3. There is an element $e \in G$ such that $a \star e = e \star a = a$ for any $a \in G$.

4. For any $a \in G$, there is an element $a' \in G$ such that $a \star a' = a' \star a = e$.