Axioms

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Definition 0.1 (associativity)**.** For all a, b, c in S, one has $(a \cdot b) \cdot c = a \cdot (b \cdot c)$.

Definition 0.2 (identity)**.** There exists an element e in S such that, for every a in S, one has $e \cdot a = a$ and $a \cdot e = a$. Such an element is unique and is called the **identity element**.

Definition 0.3 (inverse)**.** For each a in S, there exists an element b in S such that $a \cdot b = e$ and $b \cdot a = e$, where e is the identity element.

For each a, the element b is unique and is called the **inverse** of b and is denoted a^{-1}.