Identity Elements

1 Why

Take an element of an algebra, and consider the function defined on the ground set which maps elements to the result of the operation applied to the fixed element and the given element.

2 Definition

Let $(A, +)$ be an algebra. For each $a \in A$, denote by $+_a : A \to A$ the function defined by

$$+_a(b) = a + b.$$

Similarly, denote by $+^a : A \to A$ the function defined by

$$+^a(b) = b + a.$$

An **identity element** of the algbera is an element which is both a left and right identity.