# Operations

## 1 Why

We want to “combine" elements of a set.

## 2 Definition

Let $A$ be a non-empty set. An *operation* on $A$ is a function from ordered pairs of elements of the set to the same set. Operations to *combine* elements. We *operate* on ordered pairs.

### 2.1 Notation

Let $A$ be a set and $g : A \times A \to A$. We tend to forego the notation $g(a, b)$ and write $a\, g\, b$ instead. We call this *infix notation*.

Using lower case latin letters for elements and for operators confuses, so we tend to use special symbols for operations. For example, $+$, $-$, $\cdot$, $\circ$, and $\star$.

Let $A$ be a non-empty set and $+ : A \times A \to A$ be an operation on $A$. According to the above paragraph, we tend to write $a + b$ for the result of applying $+$ to $(a, b)$.