



# 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  $g : A \times A \rightarrow A$ . 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  $+: A \times A \rightarrow A$  be an operation on  $A$ . According to the above paragraph, we tend to write  $a + b$  for the result of applying  $+$  to  $(a, b)$ .