



## Why

We name the operations which produce natural sums, products and powers.

## Definition

Consider the set of natural numbers. Then we can define three functions corresponding to sums, products and powers which are operations (see **Operations**) on this set.

We call *addition* the function  $+: \omega \times \omega \rightarrow \omega$ , which maps two natural numbers  $m$  and  $n$  to their sum  $m + n$ . We call *multiplication* the function  $\cdot: \omega \times \omega \rightarrow \omega$ , which maps two natural numbers  $m$  and  $n$  to their product  $m \cdot n$ . We call *exponentiation* the function  $(m, n) \mapsto m^n$ .

In other words, we can think of sums, products, and powers as obtainable by applying a function to pairs of natural numbers. This function gives another natural number. We call these three operations the operations of *arithmetic*.



