

## ARITHMETIC

## Why

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

## Definition

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

We call addition the function  $+: \omega \times \omega \to \omega$ , which maps two natural numbers m and n to their sum m+n. We call multiplication the function  $\cdot: \omega \times \omega \to \omega$ , 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 numbers We call these three operations the operations of *arithmetic*.

