



## Why

We want a notation for expressing the sum of a sequence of real numbers.

## Definition

Let  $x = (x_1, \dots, x_n)$  be a sequence of real numbers. The *sequence sum* of  $x$  is the result of first summing the first two numbers, then summing the result with the third number, and so on, until we have summed all the numbers.

## Notation

Let  $x = (x_1, \dots, x_n)$  be a sequence of real numbers. We denote the sequence sum of  $x$  by

$$\sum_{i=1}^n x_i$$

## Summing over finite sets

Suppose  $A$  is a finite set and  $f : A \rightarrow \mathbf{R}$  is a function. Then we the notation

$$\sum_{a \in A} f(a)$$

is notation for  $\sum_{i=1}^n f(\sigma(i))$  where  $\sigma : \{1, \dots, |A|\} \rightarrow A$  is any numbering of  $A$ . The numbering is inconsequential because addition is commutative.



