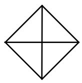


## Why

We introduce language for the steps of an infinite process.

## Definition

A *finite sequence* is a family whose index set is a natural number (excluding zero). An *infinite sequence* is a family whose index set is the set of natural numbers (without zero). The *nth term* of a sequence (finite or infinite) is the result of the $n$th natural number. Let $A$ be a non-empty set. A sequence *in* $A$ is a function from the natural numbers to the set.

## Notation

Let $A$ be a non-empty set. Let $a : \mathsf{N} \to A$ Then $a$ is a sequence in $A$. $a(n)$ is the $n$th term. We also denote $a$ by $(a_n)_n$ and $a(n)$ by $a_n$.

## Natural Unions and intersections

If $\{A_i\}$ is a finite sequence of sets indexed by $\{1, 2, \dots, n\}$, then we denote the union of the family by

$$\cup_{i=1}^{n} A_i$$

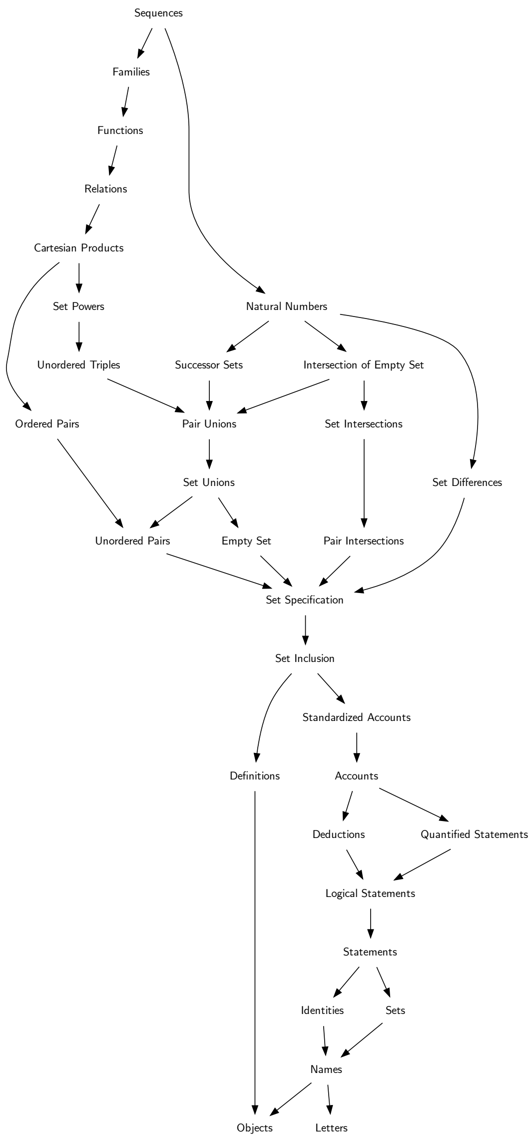
If $\{A_i\}$ is an infinite sequence of sets, then we denote the union of the family by

$$\cup_{i=1}^{\infty} A_i.$$

Similarly, we denote the intersections of a finite and infinite sequence of sets $\{A_i\}$ by

$$\cap_{i=1}^{n} A_i \quad \text{and} \quad \cap_{i=1}^{\infty} A_i.$$

respectively.



Sequences
Families
Functions
Relations
Cartesian Products
Set Powers
Natural Numbers
Unordered Triples
Successor Sets
Intersection of Empty Set
Ordered Pairs
Pair Unions
Set Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Pair Intersections
Set Specification
Set Inclusion
Standardized Accounts
Definitions
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Objects
Letters