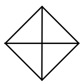


Why

As with introducing Equivalent Sets, we want to talk about the size of a set.[1]

Definition

A *finite* set is one that is equivalent to some natural number; an infinite set is one which is not finite. From this we can show that ω is infinite. This justifies the language "principle of infinity" with Natural Numbers. The principle of infinity asserts the existence of a particular infinite set; namely ω.

Motivation for set number

It happens that if a set is equivalent to a natural number, it is equivalent to only one natural number.

Proposition 1. *A set can be equivalent to at most one natural number.*[2]

A consequence is that a finite set is never equivalent to a proper subset of itself. So long as we are considering finite sets, a piece (subset) is always less than than the whole (original set).

Proposition 2. *A finite set is never equivalent to a proper subset of itself.*

[1] Will be expanded in future editions.

[2] Future edition will include proof, which uses comparability of numbers and the results of Equivalent Sets).

Subsets of finite sets

Every subset of a natural number is equivalent to a natural number.[3] A consequence is:

Proposition 3. *Every subset of a finite set is finite.*[4]

Unions of finite sets

Proposition 4. *if A and B are finite, then $A \cup B$ is finite.*

Products of finite sets

Proposition 5. *If A and B are finite, then $A \times B$ is finite.*

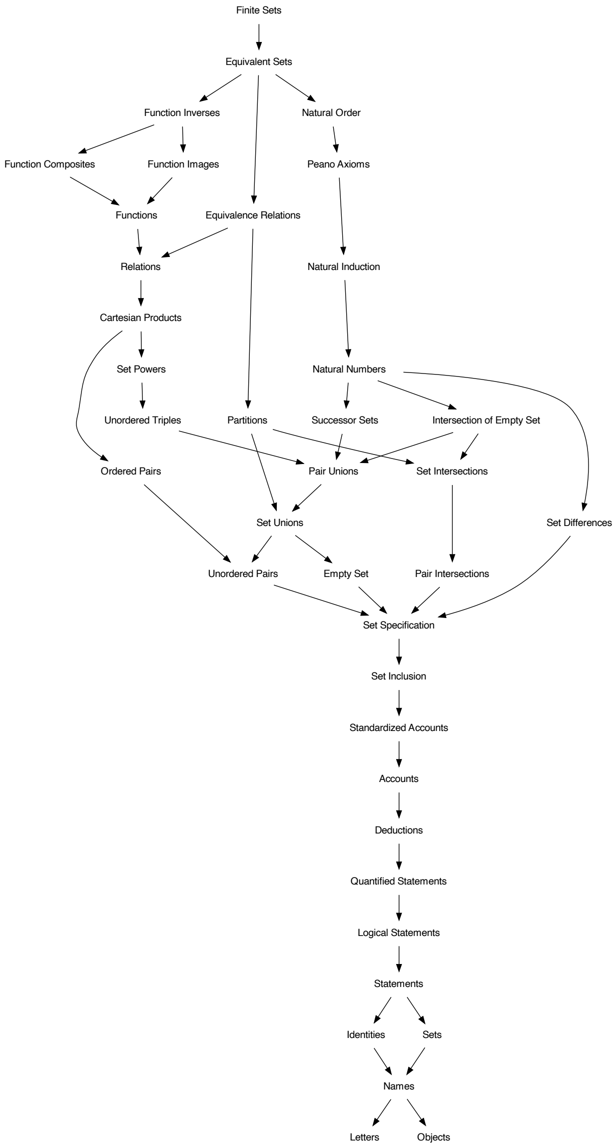
Powers of finite sets

Proposition 6. *If A is finite then $\mathcal{P}(A)$ is finite.*

Functions between finite sets

Proposition 7. *If A and B are finite, then A^B is finite.*

[3] This requires proof, and may become a proposition in future editions.
[4] An account will appear in future editions.


Finite Sets
Equivalent Sets
Function Inverses
Natural Order
Function Composites
Function Images
Peano Axioms
Functions
Equivalence Relations
Relations
Natural Induction
Cartesian Products
Set Powers
Natural Numbers
Unordered Triples
Partitions
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
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects