Why

We want to count the number of elements in a set.

Defining result

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

The *number* (or *size*) of a finite set is the unique natural number equivalent to it.

Notation

We denote the number of a set by $|A|$. Equally good notation, which we will not use in these sheets, is $\#(A)$.

Restriction to a finite set

If we restrict $E \mapsto |E|$ to the domain $\mathcal{P}(X)$ of some set X then $|\cdot| : \mathcal{P}(X) \to \omega$ is a function.[2]

Properties

Proposition 2. $A \subset B \longrightarrow |A| \leq |B|$

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[1]A proof will appear in future editions.

[2]Future editions will clarify this point.

Set Numbers

Finite Sets

Equivalent Sets

Natural Order

Function Inverses

Function Composites

Function Images

Equivalence Relations

Functions

Peano Axioms

Relations

Natural Induction

Ordered Pair Projections

Set Products

Natural Numbers

Set Powers

Intersection of Empty Set

Successor Sets

Unordered Triples

Pair Unions

Partitions

Ordered Pairs

Set Differences

Set Intersections

Set Unions

Pair Intersections

Empty Set

Unordered Pairs

Set Specification

Set Equality

Set Inclusion

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects

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