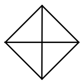


Why

Historically considered a fountainhead for all of mathematics.

Discussion

Our discussion of sets has suceeded in making Peano's axioms provable propositions.

1. $0 \in \omega$.
2. $n \in \omega \longrightarrow n^+ \in \omega$.
3. Suppose $S \subset \omega$, $0 \in S$, and $(n \in S \longrightarrow n^+ \in S$. Then $S = \omega$.

Proposition 1 (Peano's First Axiom)**.** *$0 \in \omega$.*

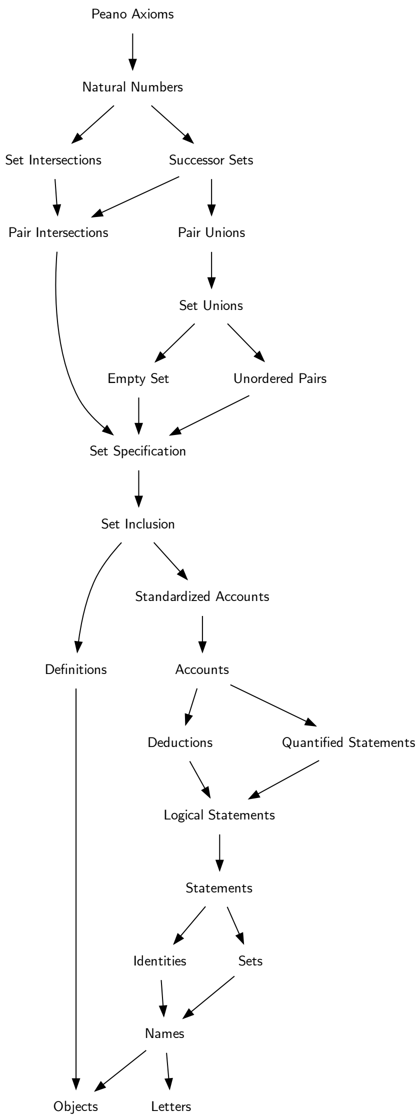
Proposition 2 (Peano's Second Axiom)**.** *$n \in \omega \longrightarrow n^+ \in \omega$.*

Proposition 3 (Peano's Third Axiom)**.** *Suppose $S \subset \omega$, $0 \in S$, and $(n \in S \longrightarrow n^+ \in S$. Then $S = \omega$.*

Peano's third axiom is called the *principle of mathematical induction.*

Proposition 4 (Peano's Fourth Axiom)**.** *$n^+ \neq 0$ for all $n \in \omega$.*

Proposition 5 (Peano's Fifth Axiom)**.** *Suppose $n, m \in \omega$ with $n^+ = m^+$. Then $n = m$.*


Peano Axioms
Natural Numbers
Set Intersections
Successor Sets
Pair Intersections
Pair Unions
Set Unions
Empty Set
Unordered Pairs
Set Specification
Set Inclusion
Standardized Accounts
Definitions
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Objects
Letters