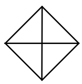


Why

We want to consider the subsets of a given set. Does a set exist which contains all the subsets.

Definition

We say yes.

Principle 1 (Powers)**.** *For every set, there exists a set containing all of the subsets.*

We call the existence of this set the *principles of powers* and we call the set the *power set*. As usual, the principle of extension gives uniqueness (see *Set Equality*). The power set of a set includes the set itself and the empty set.

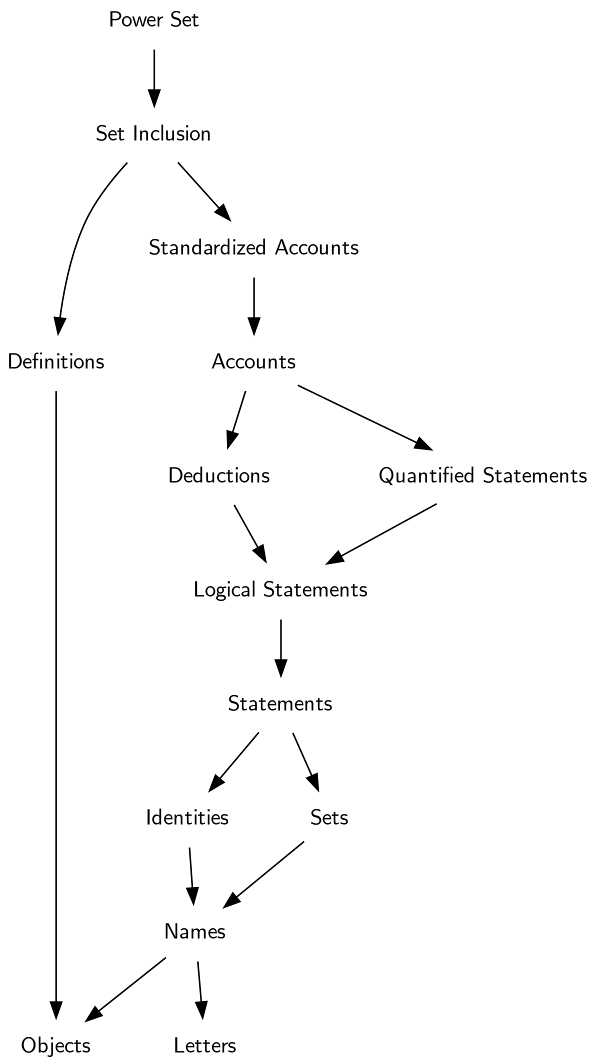
Notation

We denote the power set of A by A^*, read aloud as "powerset of A." $A \in A^*$ and $\varnothing \in A^*$. However, $A \subset A^*$ is false.

Example

Let a, b, c be distinct objects. Let $A = \{a, b, c\}$ and $B = \{a, b\}$. Then $B \subset A$. In other notation, $B \in A^*$. As always, $\varnothing \in A^*$ and $A \in A^*$ as well. In this case, we can list the elements (which are sets) of the power set:

$$A^* = \{\varnothing, \{a\}, \{b\}, \{c\}, \{a, b\}, \{b, c\}, \{a, c\}, \{a, b, c\}\}.$$


Power Set
Set Inclusion
Standardized Accounts
Definitions
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Objects
Letters