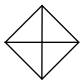


Why

If there is a set, there is an empty set. Are there many such sets? How do they (or it) relate to other sets?

Empty Set

An immediate consequence of the axiom of extension is that there is a unique set that is empty.

Account 1.

1-2	`name`	A, B		
3	`have`	$\neg((\exists a)(a \in A))$		
4	`have`	$\neg((\exists b)(b \in B))$		
5	`thus`	$(\forall x)(x \in A \implies b \in A)$	`by`	`3`
6	`thus`	$(\forall x)(x \in B \implies b \in B)$	`by`	`4`
7	`thus`	$A = B$	`by`	`5,6`

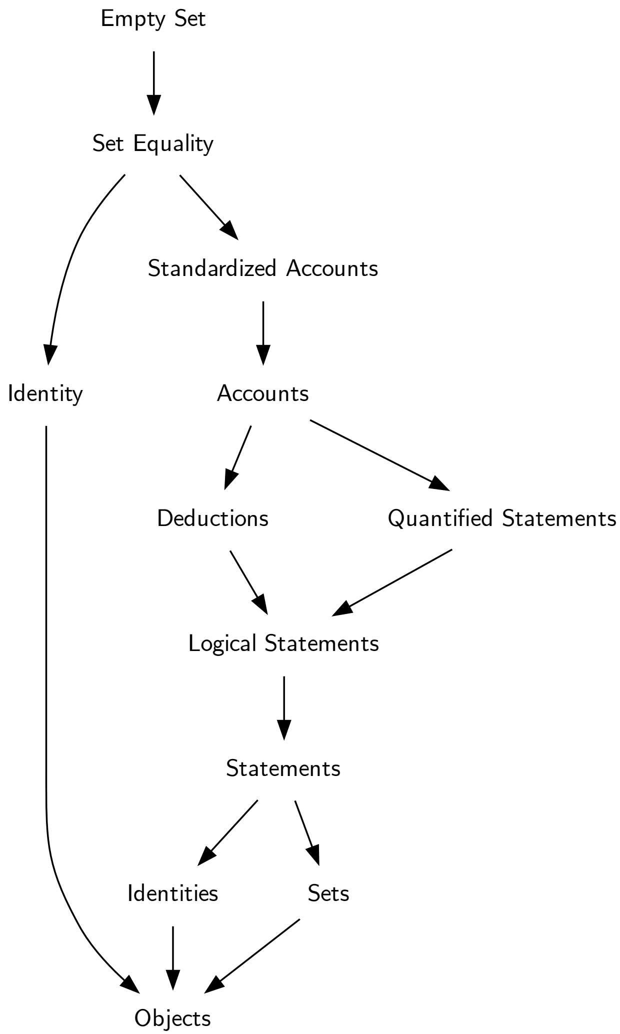
Definition

First, we assume there exists a set. As a consequence, there exists a set which contains no elements at all. We use the axiom of specification with a condition that is always false, and so selects no elements.

As a result of the axiom of extension, this set with no elements is unique. We call this empty set *the empty set.*

Notation

We denote the empty set by $\varnothing$.


Empty Set
Set Equality
Standardized Accounts
Identity
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Objects