

0.1 Axiom of union

0.1.1 Motivation

While we have described various sets, we have not said that they exist. That is, if A and B both exist, then currently we cannot ensure $A \cup B$ exists, just that it can be described.

The axiom of union enables us to ensure all sets from unions and intersections exist.

0.1.2 Axiom of union

$$\forall a \exists b \forall c [c \in b \leftrightarrow \exists d (c \in d \wedge d \in a)]$$

That is, for every set a , there exists a set b where all the elements in b are the elements of the elements in a .

Here, b is the union of the sets in a .