Why

How does the power set relate to a union?

Notation preliminaries

Let E denote a set. Let $\mathcal{A}$ denote a set of subsets of the set denoted by E. We define $\bigcup_{A \in \mathcal{A}} A$ to mean $\bigcup \mathcal{A}$.

Basic properties

Here are some basic interactions between the powerset and unions.[1]

Proposition 1. $\mathcal{P}(E) \cup \mathcal{P}(F) \subset \mathcal{P}((E \cup F))$

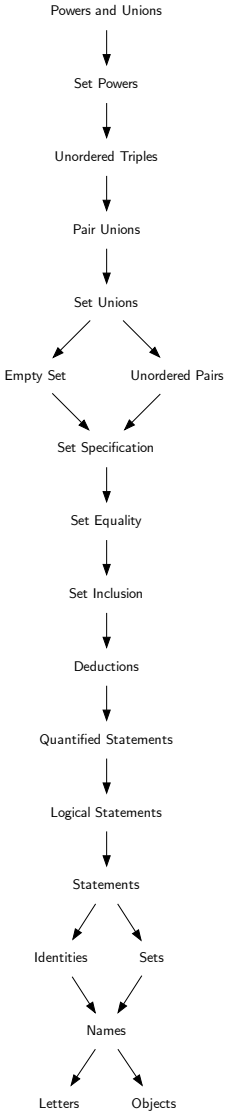
Proposition 2. $\bigcup_{X \in \mathcal{C}} \mathcal{P}(X) \subset \mathcal{P}((\bigcup_{X \in \mathcal{C}} X))$

Proposition 3. $E = \bigcup \mathcal{P}(E)$

Proposition 4. $\mathcal{P}((\bigcup E)) \supset E$.

Typically $E \neq \mathcal{P}((\bigcup E))$, in which case E is a proper subset.

[1] Future editions will expand on these propositions and provide accounts of them.


Powers and Unions
Set Powers
Unordered Triples
Pair Unions
Set Unions
Empty Set
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects