Why

How does the power set relate to a union?

ßNotation 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 $\cap \mathcal{A}$.

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

↓

Standardized Accounts

↓

Accounts

↓

Deductions

↓

Quantified Statements

↓

Logical Statements

↓

Statements

↙ ↘

Identities   Sets

↘ ↙

Names

↙ ↘

Letters   Objects