## Why

We often unite the elements of one set with another.

## Discussion

Let $A$ and $B$ denote sets. We call $\cup\{A, B\}$ the *pair union* of $A$ and $B$. We denote the union of the pair $\{A, B\}$ by $A \cup B$. Clearly the pair union does not depend on the order of $A$ and $B$. In other words, $A \cup B = B \cup A$.

## Facts

Here are some basic facts about unions of a pair of sets.[1] Let $A$ and $B$ denote sets.

**Proposition 1** (Identity Element)**.** $A \cup \varnothing = A$

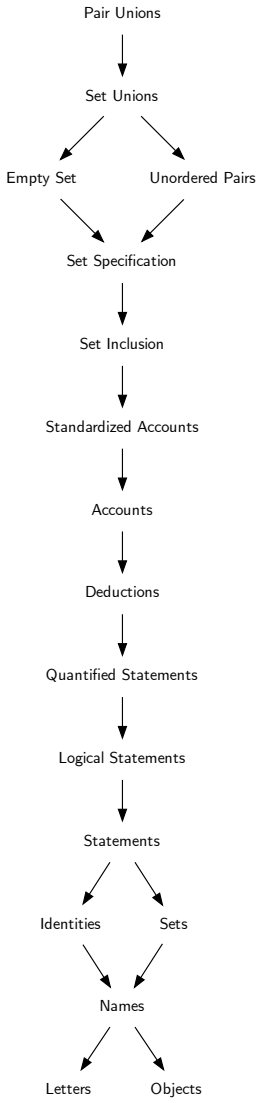
**Proposition 2** (Commutativity)**.** $A \cup B = B \cup A$

**Proposition 3** (Associativity)**.** $(A \cup B) \cup C = A \cup (B \cup C)$

**Proposition 4** (Idempotence)**.** $A \cup A = A$.

**Proposition 5.** $A \subset B \longleftrightarrow A \cup B = B$

[1] Proofs will appear in the next edition.


Pair Unions
Set Unions
Empty Set
Unordered Pairs
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
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