



PAIR UNIONS

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). $A \cup \emptyset = A$

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. $A \subset B \longleftrightarrow A \cup B = B$

¹Proofs will appear in the next edition.

