Why

If all sets considered in a union or intersection are subsets of a fixed set, then the union and intersection of any set of sets is well defined. We can then derive generalized version of DeMorgan's laws.[1]

New notation

Let E denote a set. Let $\mathcal{A}$ denote a set of subsets of E. Then define

$$\bigcup_{A \in \mathcal{A}} A := \bigcup \mathcal{A}, \quad \bigcap_{A \in \mathcal{A}} A := \bigcap \mathcal{A}.$$

In this case we have

Proposition 1. $C(\cup_{A \in \mathcal{A}} A) = \cap_{A \in A} C(A)$.

Proposition 2. $C(\cap_{A \in \mathcal{A}} A) = \cup_{A \in A} C(A)$.

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[1]In future editions, this sheet may not exist.

Generalized Set Dualities

Set Dualities

Intersection of Empty Set

Pair Unions

Set Intersections

Set Complements

Set Unions

Pair Intersections

Set Differences

Empty Set

Unordered Pairs

Set Specification

Set Equality

Set Inclusion

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects