



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. $C(\bigcup_{A \in \mathcal{A}} A) = \bigcap_{A \in \mathcal{A}} C(A).$

Proposition 2. $C(\bigcap_{A \in \mathcal{A}} A) = \bigcup_{A \in \mathcal{A}} C(A).$

¹In future editions, this sheet may not exist.

