

GENERALIZED SET DUALITIES

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

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

¹In future editions, this sheet may not exist.

