

## 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.<sup>1</sup>

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

<sup>&</sup>lt;sup>1</sup>In future editions, this sheet may not exist.

