



SET OPERATIONS

Why

We want to consider the elements of two sets together at once, and other sets created from two sets.

Definitions

We have already mentioned that set unions is an operation when considered on the powerset of some given set (see *Operations*). It is natural to expect the same for intersections (see *Pair Intersections*) and symmetric differences (see *Symmetric Differences*).

We call the operation of *forming unions* the function $(A, B) \mapsto A \cup B$. We call the operation of *forming intersections* the function $(A, B) \mapsto A \cap B$. We call the operation of *forming symmetric differences* the function $(A, B) \mapsto A + B$.

We have seen that forming unions commutes and is associative and likewise with forming intersections. As a result of the commutativity of unions and intersections, forming symmetric differences also commutes.

We call these three operations the *set operations*.

