



## 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*.



