



## Why

We want to consider the no-overlapping elements of a pair of sets.

## Definition

In other words, we want to consider the set of elements which is one or the other but not in both. The *symmetric difference* (or *Boolean sum*) of a set with another set is the union of the difference between the latter set and the former set and the difference between the former and the latter.

## Notation

Let  $A$  and  $B$  denote sets. We denote the symmetric difference by  $A + B$ , so that

$$A + B = (A - B) \cup (B - A)$$

## Properties

Here are some immediate properties of symmetric differences.<sup>1</sup>

**Proposition 1** (Commutative).  $A + B = B + A$ .

**Proposition 2** (Associative).  $(A + B) + C = A + (B + C)$ .

**Proposition 3** (Identity).  $(A + \emptyset) = A$

**Proposition 4** (Inverse).  $(A + A) = \emptyset$

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<sup>1</sup>Future editions will have more detailed (but obvious) hypotheses stated.



