



Why

We want to consider the non-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.¹

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). $(A + A) = \emptyset$

¹Future editions will have more detailed (but obvious) hypotheses stated.

