

Set Operations

Mathematics

The operations, and the identities worth recognising on sight.

Sets and their algebra. A' is the complement of A .

Operations

$A \cup B$ — in A , in B , or in both

$A \cap B$ — in both at once

$A \setminus B$ — in A but not in B

A' — everything outside A

$A \times B$ — the ordered pairs (a, b)

Identities

De Morgan: $(A \cap B)' = A' \cup B'$

$\cup$ and $\cap$ each distribute over the other

$A \cap B \Leftrightarrow A \cap (A \cup B) = B$

$|A \cap B| = |A| + |B| - |A \cup B|$

$A \cap \emptyset = \emptyset$ and $A \cup \emptyset = A$

$\in$ relates an element to a set; $\subset$ relates two sets. $\{1\} \subset \{\{1\}\}$ and $\{1\} \in \{1, 2\}$ are both true, for entirely different reasons.