

Sets and Venn Diagrams

Empty & Universal Sets

The **empty** or **null** set: \emptyset is the set that contains no elements.

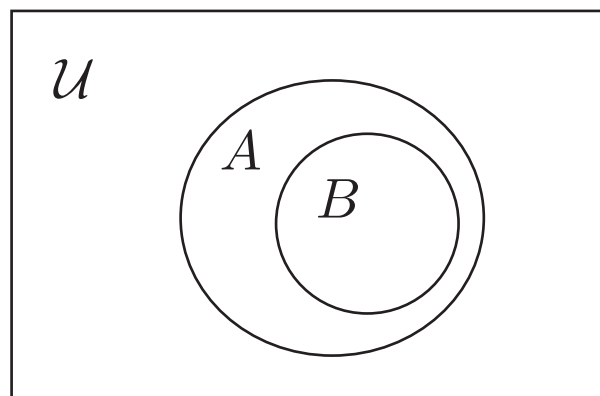
The **universal** set, \mathcal{U} or \mathcal{E} : the set that contains all the elements being considered in a particular problem.

Set membership

If an element x is a member of the set X we write $x \in X$.

Subsets

Set B is a subset of A (written $B \subseteq A$) if every element of B is an element of A , i.e. if $x \in B$ then $x \in A$. If $B \subseteq A$ and $B \neq A$ then we write $B \subset A$ and B is said to be a **proper subset** of A . The empty set is a subset of every set.

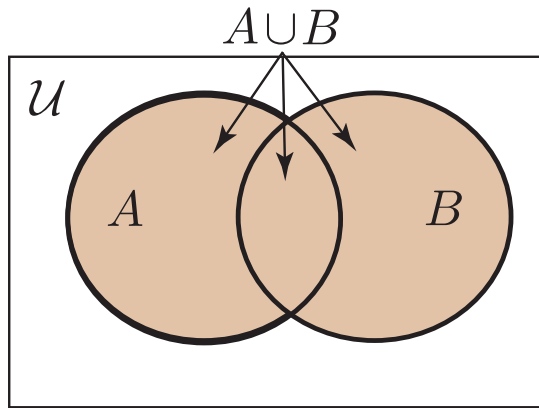


Equality of sets

$A = B$ if and only if $A \subseteq B$ and $B \subseteq A$.

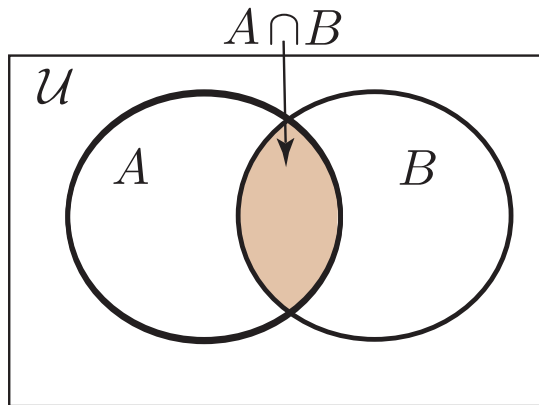
Union

$$A \cup B = \{x : x \in A \text{ or } x \in B\}.$$



Intersection

$$A \cap B = \{x : x \in A \text{ and } x \in B\}.$$



Complement

$$\overline{A} = \{x : x \notin A\}.$$

