- A set is an unordered collection of objects

ROSTER METHOD

N = natural numbers = $\{1, 2, 3 \ldots\}$

Z = integers = $\{\ldots -3, -2, -1, 0, 1, 2, 3\}$

Z^+ = positive integers = $\{1, 2, 3 \ldots\}$

R = set of real numbers

R^+ = set of +ve real numbers

C = set of complex numbers

Q = set of rational numbers

SET - BUILDER NOTATION

$S = \{x \mid Prime(x)\}$

Set Equality - Two sets are equal if & only if they have same elements.

Subsets - The set A is a subset of B, if & only if every element of A is also an element of B.

Every set is a subset of itself

Proper subset - If $A \subseteq B$, but $A \neq B$ then we say A is a proper subset of B, denoted by $A \subset B$

Set cardinality - The cardinality of a finite set A, denoted by $|A|$ is the number of (distinct) elements of A

Superset & Disjoint set :-

If A is the subset of B then B is superset of A

Two sets are said to be disjoint if they have no common elements.

Set Properties :-

- Every set A is a subset of Universal set U

  $\phi \subseteq A \subseteq U$

- Every set A is subset of itself

  $A \subseteq A$

- Transitivity

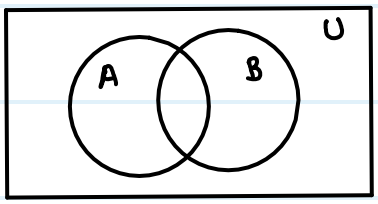
  $A \subseteq B$, $B \subseteq C$, then $A \subseteq C$

- If $A \subseteq B$ & $B \subseteq A$ then $A = B$; converse also holds true.

* Venn Diagram & Set Operations

- Union

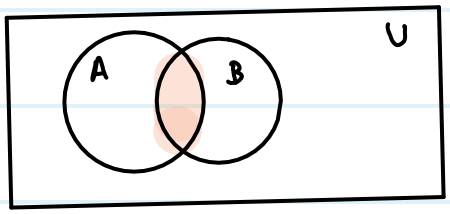
Let A & B be sets. The union of the sets A & B, denoted by $A \cup B$ is $\{x \mid x \in A \vee x \in B\}$



- Intersection

The intersection of sets A & B, denoted by $A \cap B$

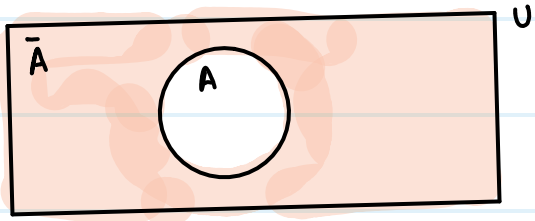
$\{x \mid x \in A \wedge x \in B\}$



- Complement

Definition : If A is a set, then complement of A (wrt U) denoted by $\bar{A}$ is set U - A

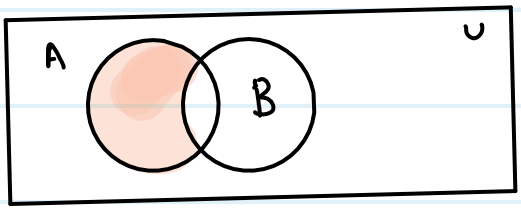
$\bar{A} = \{x \in U \mid x \notin A\}$



- Difference

Let A & B be sets. The difference of A & B, denoted by A-B, is the set containing the elements of A that not in B.

$$A - B = \{x \mid x \in A \wedge x \notin B\}$$

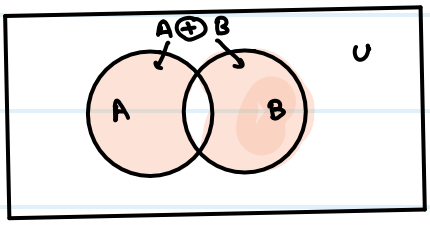


$A = \{a, b, c\}$ $B = \{b, c, d, e\}$

$A - B = \{a\}$

$B - A = \{d, e\}$

- Symmetric Difference - The symmetric difference of A & B, denoted by $A \oplus B$ is the set



- Cartesian product