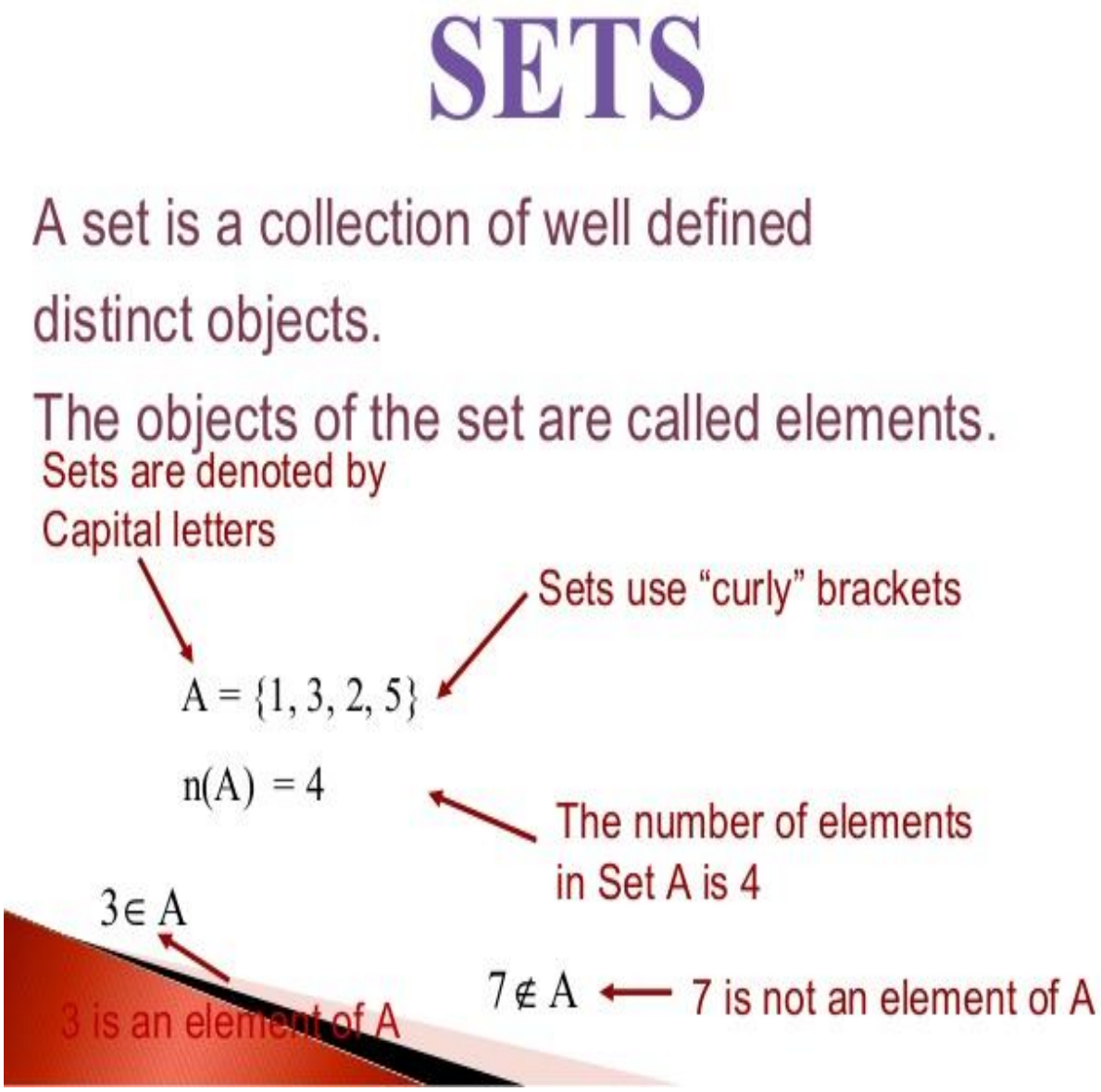
TOPIC: FRACTION AND DECIMAL



{1, 2, 3, 5} We never repeat elements in a set.

Sets can be represented by two methods:

Rooster or Tabular form:

In this the elements are separated by commas.

e.g. set A of all odd natural numbers less than 10.

A = {1,3,5,7,9}

Set builder method:

In this the common property of the elements is specified.

e.g. set A of all odd natural numbers less than 10.

A = {x : x is odd natural number less than 10}

Symbols	Meaning
{ }	enclose elements in set
∈	belongs to
⊆	is a subset of (includes equal sets)
⊂	is a proper subset of
⊄	is not a subset of
⊃	is a superset of

Kinds of Sets

- **Empty Sets or Null Sets** – sets with no elements.
  - **A = {girls in New York St. that have dicks}**
  - **A = { } or A = Ø**. The set has 0 cardinality.
- **Infinite Sets** – sets with an infinite number of elements. Unlisted elements are denoted by ellipses.
  - **F = {x|x is a number}**
- **Finite Sets** – sets with an exact number of elements.
  - **H = {penises Chad has}.** n(H)= 27.

The Power Set (P)

The power set is the set of all subsets that can be created from a given set.

Example:

A = {a, b, c}

$\mathcal{P}$ (A) = {{a, b}, {a, c}, {b, c}, {a}, {b}, {c}, A, ϕ}

Cardinal Number of A Set

It is the number of elements in a set.

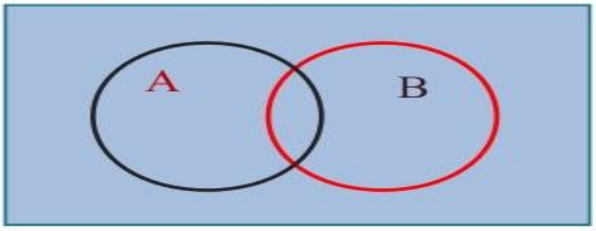
Example:

A = {a, b, c, d}

n(A) = 4

Representation of sets by means of diagrams known as:

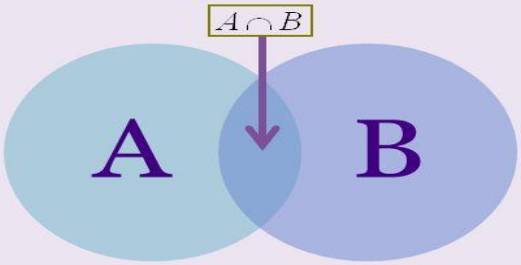
VENN DIAGRAM



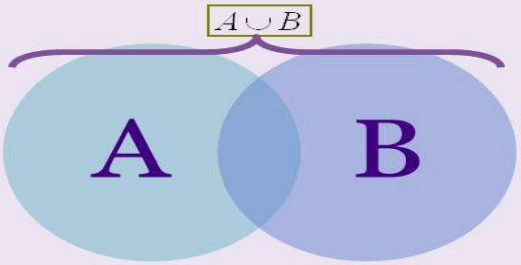
Venn Diagrams are named after the English logician, John Venn. These diagrams consist of rectangles and closed curves usually circles. The universal set is represented usually by a rectangle and its subsets by circles.

Intersection and Union of Sets

- **Intersection of Two Sets**
  - The set containing only the elements that appear in both sets.
    - Represented by the symbol $\cap$.

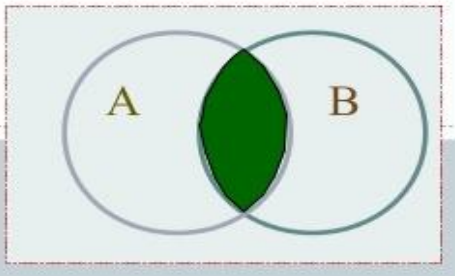


- **Union of Two Sets**
  - The set containing all the elements found in either set.
    - Represented by the symbol $\cup$.



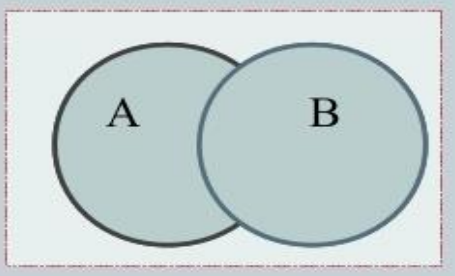
$A \cap B$

This is the intersect symbol. It means the set containing all elements that are in both A and B



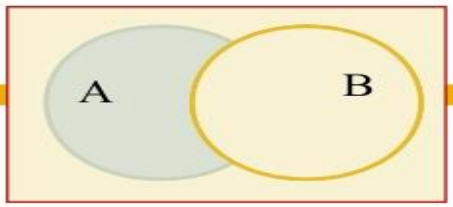
$A \cup B$

This is the union symbol. It means the set that consists of all elements of set *A* and all elements of set *B*.



Difference Of Sets

A - B

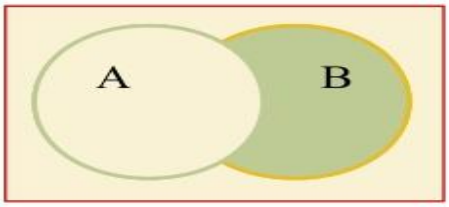


The difference of two sets A and B Is the set of elements which belongs to A but which do not belong to B. It is denoted by A – B.

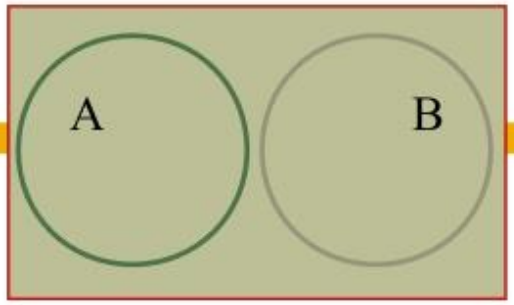
$A - B = \{x : x \in A \text{ and } x \notin B\}$

$B - A = \{x : x \in B \text{ and } x \notin A\}$

B- A



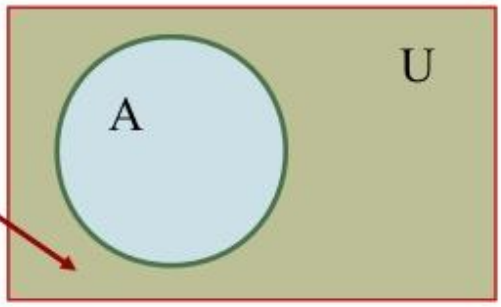
Disjoint Sets



The two sets which do not have any elements in common are called disjoint sets.

$A \cup B = \varnothing$

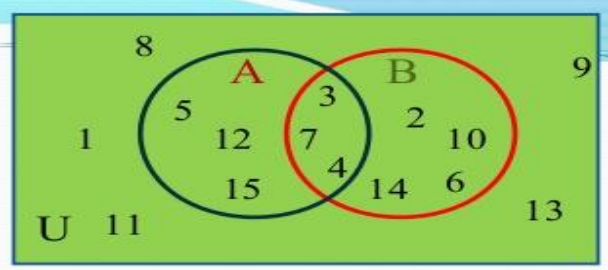
Compliment of a set



If U is the universal set, A is a subset, then compliment of A is

$A = \{x : x \in U, x \notin A\}$

or U - A



$U = \{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15\}$

$A = \{3,4,5,7,12,15\}$

$B = \{2,3,4,6,7,10,14\}$

$A \cap B = \{3,7,4\}$

$A \cup B = \{2,3,4,5,6,7,10,12,14,15\}$

$A - B = \{5,12,15\}$

$B - A = \{2,6,10,14\}$

VENN DIAGRAM

Commutative Laws:

$A \cap B = A \cap B$ and $A \cup B = B \cup A$

Associative Laws:

$(A \cap B) \cap C = A \cap (B \cap C)$ and $(A \cup B) \cup C = A \cup (B \cup C)$

Distributive Laws:

$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ and $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

Double Complement Law:

$(A^c)^c = A$

De Morgan's Laws:

$(A \cap B)^c = A^c \cup B^c$ and $(A \cup B)^c = A^c \cap B^c$