

# Types of sets

## Set

Set is a well-defined collection of distinct objects.

## Types

- 1) Empty set
- 2) Singleton set
- 3) Finite set
- 4) Infinite set
- 5) Equal set
- 6) Equivalent set
- 7) Universal set
- 8) Subset.
- 9) Proper subset
- 10) Power set.

(1)

### Empty set:

A set with having no element.

### Example

$$E = \{ \}$$

$$\text{or } E = \phi$$

(2)

### Singleton set

A set with one element, are called singleton set.

### Example

$$A = \{ 3 \}, B = \{ 2 \}, C = \{ 1 \}$$

(3)

### Finite set

A set with limited elements.

### Example

$$A = \{ 1, 2, 3, 4, \dots, 9 \}, B = \{ 2, 5, 9 \}$$

(4)

Infinite set

A set with unlimited elements.

Example

$$A = \{1, 2, 3, \dots\}$$

(5)

Equal set

Equal sets have same elements.

Example

$$A = \{E, A, R, T, H\}$$

$\{$

$$B = \{H, E, A, R, T\}$$

Hence  $A = B$

(6)

Equivalent set

Equivalent sets have different elements but have the same number of elements.

Example:

$$A = \{1, 2, 3, 4, 5\}$$

$$B = \{H, E, A, R, T\}$$

$$A \approx B$$

(7)

Universal Set

Universal set is the set containing all elements and of which all other sets are subsets.  
→ It is represented by "U"

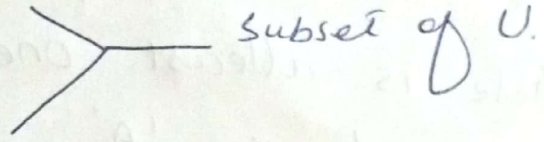


Example:

$$U = \{a, e, i, o, u\} \rightarrow \text{universal set}$$

$$A = \{a, e, o\}$$

$$B = \{i, u, o\}$$



(8)

Subset

Set 'A' is a subset of set 'B', if and only if, every element in 'A' is also an element in 'B'.

$$A \subseteq B$$

Example

$$A = \{s, i, r\}$$

List of all possible subsets of set A.

①.  $\{s, i, r\}$

②.  $\{s\}$

③.  $\{i\}$

④.  $\{r\}$

⑤.  $\{s, i\}$

⑥.  $\{i, r\}$

⑦.  $\{s, r\}$

⑧.  $\{\}$

Formula

To find, no. of subset, use formula

$$2^n$$

$$2^3 = 8$$

(9)

Proper subset

set 'A' is a proper subset of set 'B' if there is atleast one element in 'B' not contained in 'A'.

$$A \subset B$$

Example

$$A = \{h, a, b, i, t\}, B = \{a, b, i, t\}$$

$$C = \{b, i, t\}, D = \{i, t\}$$

Hence

$$B \subset A, C \subset A, D \subset A$$

(10)

Power set

The set of all the subsets of a set.

Example

$$A = \{1, 2, 3, 4\}$$

$$P(A) = \left\{ \{ \}, \{1\}, \{2\}, \{3\}, \{4\}, \{1, 2\}, \{1, 3\}, \{1, 4\}, \{2, 3\}, \{2, 4\}, \{3, 4\}, \{1, 2, 3\}, \{1, 2, 4\}, \{2, 3, 4\}, \{1, 3, 4\}, \{1, 2, 3, 4\} \right\}$$