

Mathematics

CLASS 8

Chapter one

Set

Basic concept about set

1. A set is a collection of well defined object. ie, a set of natural number less than 15.
2. Method of describing sets

Sets are usually described by three methods.

- (a) Listing or roster method, this method follows to list elements of sets. ie, $A = \{1, 2, 3, \dots, 12\}$
- (b) Description method, this method follows according to nature of elements of a set, to describing in sentence or word, ie The set of vowel sound in English alphabet.
- (c) Rule or set-builder method, this method follows sign rule ie $\{Y : Y \text{ is a whole number, } Y < 14\}$

3. Cardinal number of sets

The number of elements contain in a set is called its cardinal number. ie, if $P = \{2, 4, 6, 8, 10\}$, Then cardinal number of set p or $n(p) = 5$

4. Types of sets

According to the number of elements of sets or cardinal number of set, there are four types of sets

- (i) Null or empty set - It does not contain any elements and denoted by \emptyset (phi) or empty braces $\{\}$. Eg, set of even numbers between 10 and 12.
- (ii) Unit or Singleton set - It contains only one element, eg. $H = \{p\}$
- (iii) Finite set - It contains countable (Finite) number of elements, eg $\{1, 2, 4, \dots, 15\}$
- (iv) Infinite set - It contains innumerable (Infinite) number of elements, eg $\{1, 2, 3, 4, 5, \dots, \dots\}$

Exercise 1

- a) A set of prime numbers between 7 and 20. Express it in listing and set-builder methods.
- b) $P = \{\text{the first five multiple of 4}\}$. Express it in roster method and rewrite in set builder method.
- c) $Q = \{x : x, -3 < x < 3, x \text{ belongs to } \mathbb{Z}(\text{integer})\}$ List the elements of this set and also Express it in description method
- d) $R = \{1, 3, 5, 7, 9\}$. Express it in description method and in rule method.
- e) If $S = \{x : x \text{ is a letter in the word 'MATHEMATICS'}\}$, list the members and find $n(s)$.
- f) If $X = \{p : p \text{ is a factor of } 18\}$, list the elements of this set and find $n(X)$. 1st day end