

SETS

SUBJECT : MATHEMATICS

CHAPTER NUMBER:10

CHAPTER NAME :SETS

SUBTOPIC : Elements of Sets, Some Properties of a Set

PERIOD NO:2

CHANGING YOUR TOMORROW

Learning outcomes

- Students will be able to define elements of sets.
- Students will be able to apply properties of sets.

PREVIOUS KNOWLEDGE TEST

1. Write the set containing:

(i) the first five counting numbers, (ii) the three types of angles

(iii) the three types of triangles (iv) the members of your family

(v) the first six consonants of the English Alphabet

(vi) the first four vowels of the English Alphabet

(vii) the names of any three Prime – Ministers of India

Solution:(i) $\{1, 2, 3, 4, 5\}$ is a set of first five counting numbers

(ii) $\{\text{right angle, acute angle, obtuse angle}\}$ is a set of three types of angles

PREVIOUS KNOWLEDGE TEST

(iii) {right triangle, acute triangle, obtuse triangle} is a set of three types of triangles

(iv) {write the name of your family members} is a set of the members of your family.

(v) {b, c, d, f, g, h} is a set of first six consonants of the English Alphabet

(vi) {a, e, i, o} is a set of four vowels of the English Alphabet

(vii) {Narendra Modi, Dr Manmohan Singh, A.B Vajpayee} is a set of three Prime Ministers of India

SETS

- Students will Learn properties of sets with the help of a video .
- <https://www.youtube.com/watch?v=l3-A0O42Lyo>(3.35)

SETS

A set is a collection of well defined distinct objects.

The objects of the set are called elements.

Sets are denoted by

Capital letters

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

$$n(A) = 4$$

$$3 \in A$$

3 is an element of A

Sets use "curly" brackets

The number of elements in Set A is 4

$$7 \notin A$$

7 is not an element of A

Each object in a set is called an element or a member of the set.

Sets notation: A, B, C, \dots

Elements Notation: a, b, c, \dots



For example, $A = \{a, b, c, d\}$

$b \in A$

'b is an element of set A' or 'b is in A'

$f \notin A$

'f is not an element of set A' or 'f is not in A'



Example 1

Check

Evaluation Question Exercise 10-B

3. State, whether true or false:

(i) Sets $\{4, 9, 6, 2\}$ and $\{6, 2, 4, 9\}$ are not the same.

(ii) Sets $\{0, 1, 3, 9, 4\}$ and $\{4, 0, 1, 3, 9\}$ are the same.

(iii) Sets $\{5, 4\}$ and $\{5, 4, 4, 5\}$ are not the same.

(iv) Sets $\{8, 3\}$ and $\{3, 3, 8\}$ are the same.

(v) Collection of vowels used in the word 'ALLAHABAD' forms a set.

(vi) If P is the set of letters in the word 'ROOP', then $P = \{P, O, R\}$

(vii) If M is the set of letters used in the word 'MUMBAI', then $M = \{M, U, B, A, I\}$

Evaluation Question

Solution:

(i) Two sets are said to be equal if they contain same elements

Here, sets $\{4, 9, 6, 2\}$ and $\{6, 2, 4, 9\}$ contain same elements

Hence, both sets are same

\therefore The given statement is false

(ii) Two sets are said to be equal if they contain same elements

Here, Sets $\{0, 1, 3, 9, 4\}$ and $\{4, 0, 1, 3, 9\}$ contain same elements

Hence, both sets are same

\therefore The given statement is true

Evaluation Question

(iii) Two sets are said to be equal if they contain same elements

Here, Sets $\{5, 4\}$ and $\{5, 4, 4, 5\}$ contain same elements

Hence, both sets are same

∴ The given statement is false

(iv) Two sets are said to be equal if they contain same elements

Here, sets $\{8, 3\}$ and $\{3, 3, 8\}$ contain same elements

Hence, both sets are same

∴ The given statement is true

Evaluation Question

5. (a) Write the members (elements) of each set given below:

(i) $\{3, 8, 5, 15, 12, 7\}$ (ii) $\{c, m, n, o, s\}$

(b) Write the sets whose elements are:

(i) 2, 4, 8, 16, 64 and 128 (ii) 3, 5, 15, 45, 75 and 90

Solution:

(a)(i) The members of set $\{3, 8, 5, 15, 12, 7\}$ are 3, 8, 5, 15, 12 and 7

(ii) The members of set $\{c, m, n, o, s\}$ are c, m, n, o and s

(b) (i) The set of elements 2, 4, 8, 16, 64 and 128 are $\{2, 4, 8, 16, 64, 128\}$

(ii) The set of elements 3, 5, 15, 45, 75 and 90 are $\{3, 5, 15, 45, 75, 90\}$

Evaluation Question

6. (i) Write the set of letters used in the word 'BHOPAL'.
(ii) Write the set of vowels used in the word 'BENGAL'.
(iii) Write the set of consonants used in the word 'HONG KONG'.

Solution:

- (i) {B, H, O, P, A, L} is the set of letters used in the word 'BHOPAL'.
(ii) {A, E} is the set of vowels used in the word 'BENGAL'.
(iii) {H, N, G, K} is the set of consonants used in the word 'HONG KONG'.

Evaluation Question Exercise 10 -C

1. Write each of the following sets in the Roster Form:

(i) The set of five numbers each of which is divisible by 3

(ii) The set of integers between -4 and 4

(iii) $\{x: x \text{ is a letter in the word 'SCHOOL'}\}$

(iv) $\{x: x \text{ is an odd natural number between 10 and 20}\}$

(v) $\{\text{Vowels used in the word 'AMERICA'}\}$

Evaluation Question

Solution:

(i) The set of first five numbers each of which is divisible by 3 in the Roster form is $\{3, 6, 9, 12, 15\}$

(ii) The set of integers between -4 and 4 in Roster Form is $\{-3, -2, -1, 0, 1, 2, 3\}$

(iii) The Roster form for a set $\{x: x \text{ is a letter in the word 'SCHOOL'}\}$ is $\{S, C, H, O, L\}$

(iv) $\{11, 13, 15, 17, 19\}$ is the Roster form for a set $\{x: x \text{ is an odd natural numbers between 10 and 20}\}$

(v) $\{A, E, I\}$ is the Roster form for a set $\{\text{Vowels used in the word 'AMERICA'}\}$

Additional Homework

1. Let $E = \{\text{odd integers}\}$. Insert the appropriate symbol \in or \notin in the blanks:

(i) $10 \dots E$

(ii) $-8 \dots E$

(iii) $13 \dots E$

(iv) $\{6\} \dots E$

(v) $a \dots E$

HW
Ex.10B

THANKING YOU
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