

Jender Heart High School, Sector - 33B, Chandigarh

Class - VI

Date - 16.12.2024

Subject - Mathematics

Teacher - Ms. Sushma

Chapter - 7 Sets

Exercise - 7A

1. Which of the following collections are sets? If any collection is not a set, give reasons.

(i) All persons on earth.

It is a set

(ii) All male teachers of your school.

It is a set

(iii) All leaders of India

Not a set as there is no definition of being a "leader".

(iv) All healthy people of your town.

It is not a set as healthy is not well defined

(v) All fat boys of your locality.

It is not a set "fat" is not well-defined.

2. Describe each of the following sets in Roster form:-

(i) $A = \{x : x \text{ is a natural number, } 5 < x < 14\}$

$A = \{6, 7, 8, 9, 10, 11, 12, 13\}$

(ii) $B = \{x : x \text{ is a factor of } 18\}$

$B = \{1, 2, 3, 6, 9, 18\}$

//_

(iii) $C = \{x: x \text{ is a prime factor of } 330\}$
 $C = \{2, 3, 5, 11\}$

(iv) $D = \{x: x \text{ is a 2-digit number, the sum of whose digits is } 8\}$

$$D = \{17, 26, 35, 44, 53, 62, 71, 80\}$$

v $E = \{x: x \text{ is a natural no, } x \text{ is a multiple of } 7, x < 60\}$

$$E = \{7, 14, 21, 28, 35, 42, 49, 56\}$$

(vi) $F = \{x: x \text{ is a natural number, } x \text{ is neither prime nor composite}\}$
 $= \{1\}$

(vii) $G = \{x: x \text{ is an even prime number}\}$
 $= \{2\}$

(viii) $H = \{x: x \text{ is an odd natural number, } 50 < x < 60\}$
 $= \{51, 53, 55, 57, 59\}$

Q 3. Describe each of the following sets in set-builder form:-

(i) $A = \{16, 18, 20, 22, 24, 26, 28\}$

$$A = \{x: x \text{ is an even natural no, } 15 < x < 30\}$$

$$B = \{23, 25, 27, 29, 31, 33, 35\}$$

$$B = \{x: x \text{ is an odd natural number, } 22 < x < 36\}$$

(iii) $C = \{1, 3, 5, 9, 15, 45\}$
 $= \{x : x \text{ is a factor of } 45\}$

(iv) $D = \{15, 24, 33, 42, 51, 60\}$
 $= \{x : x \text{ is a 2-digit number and sum of digit is } 6\}$

(v) $E = \{6, 12, 18, 24, 30, 36, 42, 48\}$
 $= \{x : x \text{ is a multiple of } 6, x < 50\}$

(vi) $F = \{41, 43, 47, 53, 59, 61, 67, 71, 73\}$
 $= \{x : x \text{ is a prime no. b/w } 40 \text{ and } 75\}$

(vii) $G = \{0, 1, 4, 9, 16, 25, 36, 49\}$
 $= \{x : x = n^2, n \text{ is a whole no. } 0 \leq n \leq 7\}$

Q4. Let $A = \{5, 7, 11, 13, 17, 19, 23, 29\}$
 Insert the appropriate symbol $\in$ or $\notin$ in the blank spaces.

- | | | |
|--------------------|-------------------|--------------------|
| (i) $7 \in A$ | (ii) $9 \notin A$ | (iii) $3 \notin A$ |
| (iv) $15 \notin A$ | (v) $17 \in A$ | (vi) $25 \in A$ |
| (vii) $11 \in A$ | (viii) $31 \in A$ | |

Q5. Let $B = \{2, 4, 6, 8, 10, \dots, 74, 76, 78, 80\}$.
 Insert the appropriate symbol $\in$ or $\notin$ in the blank spaces,

- (i) $26 \in B$
- (ii) $31 \notin B$
- (iii) $70 \in B$
- (iv) $15 \notin B$
- (v) $60 \in B$

- (vi) $53 \notin B$
- (vii) $47 \notin B$
- (viii) $34 \in B$

Q5 (i) True

(ii) False as $-5 \notin$ to the set.

(iii) True

(iv) False, $2 < 3$ and $2 \notin$ the set.

(v) True

Exercise 7.8

Q1 Write each of the following set in roster form and write its cardinal number.

(i) $A = \{x : x \in W, x < 6\}$

$$A = \{0, 1, 2, 3, 4, 5\}$$

$$n(A) = 6$$

(ii) $B = \{x : x \in N, \text{ is a multiple of } 4, x < 30\}$

$$B = \{4, 8, 12, 16, 20, 24, 28\},$$

$$n(B) = 7$$

(iii) $C = \{x : x \in N, x \text{ is a perfect square}, x < 30\}$

$$C = \{1, 4, 9, 16, 25\}$$

$$n(C) = 5$$

(iv) $D = \{x: x \in \mathbb{N}, x \text{ is a composite no, } 10 < x < 18\}$
 $= \{12, 14, 15, 16\}$

$n(D) = 4$

(v) $E = \{x: x \text{ is an odd prime number, } x < 18\}$
 $= \{3, 5, 7, 11, 13, 17\}$

$n(E) = 6$

(vi) $F = \{x: x \in \mathbb{N}, 5 < x < 6\}$
 $= \{ \}$

$n(F) = 0$

(vii) $G = \{x: x \text{ is a letter in the word "ALLAHABAD"}\}$
 $= \{A, L, H, B, D\}$

$n(G) = 5$

Q2. Let $A = \{x: x \text{ is a letter in the word INCREASE}\}$

$B = \{x: x \text{ is a vowel in the word INCREASE}\}$

and $C = \{x: x \text{ is a Consonant in the word}$

$' \text{ INCREASE} \}$.

(i) Write A, B, C in Roster form

(ii) Find $n(A)$, $n(B)$, $n(C)$

Ans (i) $A = \{I, N, C, R, E, A, S\}$, $n(A) = 7$

$$B = \{I, E, A\}, n(B) = 3$$

$$C = \{N, C, R, S\}, n(C) = 4$$

Q3. Which of the sets are equal?

(i) $A = \{x : x \in \mathbb{N}, 1 < x < 3\}$ and
 $B = \{x : x \text{ is prime, } x \text{ is even}\}$

Soln:- $A = \{2\}$
 $B = \{2\}$

So, $A = B$.

They are equal sets.

(ii) $C = \{x : x \in \mathbb{W}, x < 8\} = \{0, 1, 2, 3, 4, 5, 6, 7\}$
 $D = \{x : x \in \mathbb{N}, x < 9\} = \{1, 2, 3, 4, 5, 6, 7, 8\}$

$$0 \notin D \text{ and } 8 \notin C$$

$$\text{So } C \neq D$$

They are not equal but are equivalent.

(iii) $E = \{x : x \in \mathbb{N}, x \text{ is odd}, x < 6\}$
 $= \{1, 3, 5\}$

$$F = \{x : x \in \mathbb{N}, x \text{ is a factor of } 15, x < 15\}$$
$$= \{1, 3, 5\}$$

$$\therefore E = F$$

They are equal sets.

(iv) $G = \{x : x \text{ is a prime factor of } 12\}$
 $= \{2, 3\}$

$$H = \{x : x \text{ is prime}, x < 9\}$$
$$= \{2, 3\}$$

$$G = H$$

They are equal sets.

(v) ϕ and $\{0\}$.

They are not equal.