SETS

SUBJECT : MATHEMATICS
CHAPTER NUMBER:10
CHAPTER NAME :SETS
SUBTOPIC : . Cardinality of a Set
PERIOD NO:7

Learning outcomes

- Students will be able to find cardinality of a set .
- Students will develop application skill.

1. State whether the given pairs of sets are equal or equivalent.

(i) M = {multiples of 2 and 3 between 10 and 20} and N = {multiples of 2 and 5 between 10 and 20}.

(ii) P = {prime numbers which divide 70 exactly} and Q = {prime numbers which divide 105 exactly}

(iii) A = {0^2, 1^2, 2^2, 3^2, 4^2} and B = {16, 9,4, 1, 0}.

(iv) E = {8, 1O, 12, 14, 16} and F = {even natural numbers between 6 and 18}.

Negative numbers and Integers

Students will Learn cardinality of a set with the help of a video .
https://www.youtube.com/watch?v=ZvmtUacSxl4(3.5)

Cardinality of a Set

"The number of elements in a set."

Let A be a set.

a. If $A = \varnothing$ (the empty set), then the cardinality of A is 0.

b. If A has exactly n elements, n a natural number, then the cardinality of A is n. The set A is a *finite set*.

c. Otherwise, A is an *infinite set*.

SETS

Example	Cardinality
A = { 5 }	|A| = 1
B = { 7,2 }	|B| = 2
C = { 1,3,4 }	|C| = 3
D = { 9,1,5,8 }	|D| = 4
E = { 5,5,5,5,5 }	|E| = 1

Evaluation Question EX-10 E

1. Write the cardinal number of each of the following sets:

(i) A = {0, 1, 2, 4}

(ii) B = {-3, -1, 1, 3, 5, 7}

(iii) C = {}

(iv) D = {3, 2, 2, 1, 3, 1, 2}

(v) E = {Natural numbers between 15 and 20}

Solution:(i) Given set is   A = {0, 1, 2, 4}

Here, the cardinal number i.e. n (A) = 4

(ii) Given set is B = {-3, -1, 1, 3, 5, 7}

Here, the cardinal number i.e. n (B) = 6

(iii) Given set is C = {}

Here, the cardinal number i.e. n (C) = 0

(iv) Given set is   D = {3, 2, 2, 1, 3, 1, 2}

D = {1, 2, 3}

Here, the cardinal number i.e. n (D) = 3

- (v) Given set is

(v) Given set is E = {Natural numbers between 15 and 20}

E = {16, 17, 18, 19}

Here, the cardinal number i.e. n (E) = 4

2. Given

(a) A = {Natural numbers less than 10}

B = {Letters of the word 'PUPPET'}

C = {Squares of first four whole numbers}

D = {Odd numbers divisible by 2}

Find:

(i) n (A)   **(ii) n (B)**   **(iii) n (C)**

(iv) n (D)

Evaluation Question

(i)A = {Natural numbers less than 10}

A = {1, 2, 3, 4, 5, 6, 7, 8, 9}   Hence, n (A) = 9

(ii)B = {Letters of the word 'PUPPET'}

B = {P, U, E, T}   Hence, n (B) = 4

(iii)C = {Squares of first four whole numbers}

C = {0, 1, 4, 9}   Hence, n (C) = 4

(iv) D = {Odd numbers divisible by 2}

D = {}   Hence, n (D) = 0

3. State true or false for each of the following. Correct the wrong statement

(i) If A = {0}, then n (A) = 0

(ii) n (φ) = 1

(iii) If T = {a, l, a, h, b, d, h}, then n (T) = 5

(iv) If B = {1, 5, 51, 15, 5, 1}, then n (B) = 6

Solution:(i) If A = {0}, then n (A) = 0

The statement given here is false

Correct statement: If A = {0}, then n (A) = 1

(ii) n (φ) = 1

The statement given here is false

Correct statement: n (φ) = 0

(iii) If T = {a, l, a, h, b, d, h}, then n (T) = 5

T = {a, l, h, b, d}

i.e. n (T) = 5

Hence, the given statement is true

(iv) Given

If B = {1, 5, 51, 15, 5, 1}, then
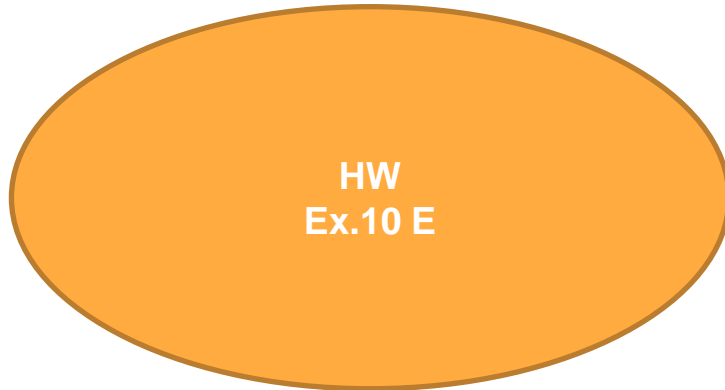
n (B) = 6

The statement given here is false

B = {1, 5, 15, 51}

i.e. n (B) = 4

Correct statement: If B = {1, 5, 51, 15, 5, 1}, then n (B) = 4

Additional Homework

1. **Examine which of the following sets are the empty sets :**

(i) The set of triangles having three equal sides.

(ii) The set of lions in your class.

(iii) {x: x + 3 = 2 and x ∈ N}

(iv) P = {x : 3x = 0}

**HW
Ex.10 E**

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