classmate
Date 30.9.21
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Homework

Exercise - 10 (b)

1. State whether the given set is infinite or finite.

(i) $\{3, 5, 7, \ldots\ldots\ldots\}$
(ii) $\{1, 2, 3, 4\}$
(iii) $\{\ldots\ldots, -3, -2, -1, 0, 1, 2\}$
(iv) $\{20, 30, 40, 50, \ldots, 200\}$

Solution:

(i) Set $\{3, 5, 7 \ldots\ldots\ldots\}$ is infinite.
(ii) Set $\{1, 2, 3, 4\}$ is finite.
(iii) Set $\{\ldots\ldots -3, -2, -1, 0, 1, 2\}$ is infinite
(iv) Set $\{20, 30, 40, 50 \ldots\ldots\ldots\ldots\ldots 200\}$ is finite.

2. Which of the following sets is empty?

(i) Set of counting numbers between 5 and 6.
(ii) Set of odd numbers between 7 and 19.
(iii) Set of odd numbers between 7 and 9.
(iv) Set of even numbers which are not divisible by 2.
(v) $\{0\}$

Solution.

(i) We know that, there is no counting number between 5 and 6.
Hence, the given set is empty.

(ii) There are elements in the set of odd numbers between 7 and 9.
Hence, the given set is empty.

(iii) We know that, there is no odd numbers between 7 and 9.
Hence, the given set is empty.

(iv) We know that there is no even number that is not divisible by 2.
Hence the given set is empty.

(v) We find one element in the given set.
Hence, the given set is not empty.

3. State which pair of sets given below are equal sets which are equivalent.

(i) $\{3,5,7\}$ and $\{5,3,7\}$
(ii) $\{8,6,10,12\}$ and $\{3,2,4,6\}$
(iii) $\{7,7,2,2,2\}$ and $\{1,2,7\}$
(iv) $\{2,4,6,8,10\}$ and $\{a,b,d,e,m\}$

Solution:

(i) Given sets
$\{3,5,7\}$ and $\{5,3,7\}$
The elements are same in both sets.
Hence, the given is equal.

(ii) Given sets
$\{8,6,10,12\}$ and $\{3,2,4,6\}$

The elements are not same in both sets of both the sets Hence, the given set are different but the number of element is same.

Hence the given pair sets is equivalent.

(iii) Given sets
{7, 7, 2, 1, 2} and {1, 2, 7}

The elements are same in both the sets.
Hence, the given pair of sets is equal.

(iv) Given sets
{2, 4, 6, 8, 10} and {a, b, o, e, m}

The element of both the sets are different but number of element is same.

4. State which of the following are finite and which are infinite.

(i) Set of integers (ii) {Multiple of 5}
(iii) {fraction between 1 and 2}
(iv) {Number of people in India}
(v) Set of trees in the world.
(vi) set of leaves on a tree.
(vii) Set of childrean in all the schools of Delhi
(viii) {..., -4, -2, 0, 2, 4, 6, 8}
(ix) {-12, -9, -6, -3, 0, 3, 6, ...}
(x) {Number of points in a line segment 4cm long}.

Solution:

(i) We know integers are infinite.
Hence, set of integers are infinite.

(ii) We know multiple of 5 are infinite.
Hence, set of {multiple of 5} is infinite.

(iii) There are infinite number of fraction between 1 and 2,
Hence, Set {fraction between 1 and 2} is infinite.

(iv) There is finite number of people in India.
Hence, set {Number of people in India} is finite.

(v) There are infinite number of trees in world.
Hence, set {of tree in world's} is infinite.

(vi) There is finite number of leaves on a tree.
Hence, the set of leaves on a tree is finite.

(vii) We know that children in all schools of Delhi are counted.
Hence, the set of children in all the school of Delhi are finite.

(viii) There are uncounted numbers of integers in this set.
Hence, the set is infinite.

(ix) There are uncountable positive integers in this set.
Hence, the set is infinite.

(x) Uncounted numbers of points in a line segme
Hence, the set is infinite.

Exercise - 10 (E)

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

(i) $A = \{0, 1, 2, 4\}$
(ii) $B = \{-3, -1, 1, 3, 5, 7\}$
(iii) $C = \{\}$
(iv) $D = \{3, 2, 2, 1, 3, 1, 2\}$

Solution:

(i) Given set is
$A = \{0, 1, 2, 4\}$
Here the cardinal number is $n(A) = 4$

(ii) Given set is
$B = \{-3, -1, 1, 3, 5, 7\}$
Here, the cardinal number i.e. $n(C) = 0$

(iii) Given set is
$D = \{3, 2, 2, 1, 3, 2\}$
$D = \{1, 2, 3\}$
Here the cardinal number i.e. $n(D) = 3$

(iv) Given set is
$C = \{\}$
Here, the cardinal number i.e. $n(C) = 0$

v- Given set is
E = {Natural numbers between 15 and 20}
$E = \{16, 17, 18, 19\}$
Here, the cardinal number i.e. $n(E) = 4$

vi- Given set is
F = {Whole numbers from 8 to 14}
$F = \{8, 9, 10, 11, 12, 13, 14\}$
Here, the cardinal number i.e. $n(F) = 7$

2. Given:

(i) A = {Natural numbers less than 10}
(ii) B = {Letters of the word 'Puppet'}
(iii) C = {Natural numbers between 15 and 20}
(iv) D = {Odd numbers divisible by 2}

Solution:

(i)- Given
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}

Here,
A = {Natural number less than 10}
$A = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

Hence n(A) = 9

(ii) Here,
B = Letters of the word 'Puppet'
B = {P, U, E, T}
Hence, n(B) = 4

(iii) Here,
C = {Squares of first four whole numbers}
C = {0, 1, 4, 9}
Hence, n(C) = 4

(iv) Here,
D = {Odd numbers divisible by a}
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(∅) = 1
(iii) If T = {a, l, a, h, b, d, h}; then n(T) = 5
(iv) If B = {1, 5, 5, 1, 15, 5, 1}, then n(B) = 6

Solution:

(i) Given
If A = {0}, then n(A) = 0
The statement given here is false.
Correct statement : If A = {0}, then n(A) =

(ii) Given

$n(\phi) = 1$

The statement given here is false.

Correct statement : $n(\phi) = 0$

(iii) Given :

If $T = \{a, 1, a, h, b, d, h\}$ then $n(T) = 5$

$T = \{a, 1, h, b, d\}$

i.e. $n(T) = 5$

Hence, the given statement is true.

(iv) Given :

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

The statement given here is false.

i.e. $n(B) = 4$

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