

Q No 1: Which of the following are examples of the null set.

- (i) Set of odd natural numbers divisible by 2.
Null Set $\because$ There is no odd natural no. divisible by 2.
- (ii) Set of even prime numbers
 $= \{2\}$ Which is not Null Set.
- (iii) $\{x; x \text{ is a natural No. } x < 5 \text{ and } x > 7\}$
 $= \emptyset$, Null Set $\because$ No Natural number can be both $x < 5$ and $x > 7$.
- (iv) $\{y; y \text{ is a point common to any two parallel lines}\}$
 $= \emptyset$, Null Set $\because$ Parallel lines do not intersect at any point.

Q No 2: Which of following sets are finite or infinite

- (i) The set of months of a year.
Finite Set $\because$ There are 12 months in a year.
- (ii) $\{1, 2, 3, \dots\}$
Infinite Set $\because$ There are infinite number of Natural Nos.
- (iii) $\{1, 2, 3, \dots, 99, 100\}$
Finite Set because the set contains 100 natural Nos.
- (iv) The set of +ve integers greater than 100
INFINITE SET $\because$ there are infinite no. of natural nos > 100 .
- (v) The set of prime numbers less than 99
Finite Set as there are finite no. of prime number less than 99. $\{2, 3, 5, 7, \dots, 97\}$

Q No 3: State whether the following set is finite or infinite:

- (i) The set of lines which are parallel to x-axis
Since infinite number of lines can be drawn parallel to x-axis
∴ It is an Infinite Set.
- (ii) The set of letters in English alphabet.
As there are 26 English alphabets, So it is Finite Set.
- (iii) The set of numbers which are multiples of 5.
 $= \{5, 10, 15, \dots\}$ which is an infinite set.
- (iv) The set of animals living on the earth.
Finite set $\because$ finite number of animals live on earth
- (v) The Set of circle passing through the origin.
Since infinitely many circles can be drawn passing through the origin. Thus it is an Infinite Set.

QNo 4: In the following state whether $A = B$

(i) $A = \{a, b, c, d\}$; $B = \{d, c, b, a\}$

Here $A = B$ because in listing members of a set, order of members in set does not matter.

(ii) $A = \{4, 8, 12, 16\}$; $B = \{8, 4, 16, 18\}$

Here $A \neq B$ $\because 12 \in A$ but $12 \notin B$, $18 \in B$ but $18 \notin A$

(iii) $A = \{2, 4, 6, 8, 10\}$; $B = \{x; x \text{ is +ve even integer and } x \leq 10\}$

Here $A = B$ $\because$ A and B are Roster and set-building form of same set.

(iv) $A = \{x; x \text{ is multiple of } 10\}$; $B = \{10, 15, 20, 25, 30, \dots\}$

Here $A \neq B$ $\because 15, 25, \dots$ do not belong to set A as these are not multiples of 10.

QNo 5 Are the following sets equal? Give reasons.

(i) $A = \{2, 3\}$; $B = \{x; x \text{ is solution of } x^2 + 5x + 6 = 0\}$

Sol. No $A \neq B$

$\because x^2 + 5x + 6 = 0 \Rightarrow (x+3)(x+2) = 0 \Rightarrow x = -3, -2$

$\therefore B = \{-3, -2\}$

But $A = \{2, 3\}$ Hence $A \neq B$.

(ii) $A = \{x; x \text{ is a letter in word FOLLOW}\}$
 $B = \{y; y \text{ is a letter in word WOLF}\}$

Sol. Yes $A = B$

$\therefore$ Here $A = \{F, O, L, W\}$ and $B = \{W, O, L, F\}$

Since $\forall x \in A, x \in B$ and $\forall x \in B, x \in A, \therefore A = B$.

QNo 6: From the sets given below, select equal sets.

$A = \{2, 4, 8, 12\}$; $B = \{1, 2, 3, 4\}$; $C = \{4, 8, 12, 14\}$

$D = \{3, 1, 4, 2\}$; $E = \{-1, 1\}$; $F = \{0, 9\}$; $G = \{1, -1\}$; $H = \{0, 1\}$

Sol

$B = D$ as B and D have same order and same members.

$E = G$ (Same reason as above)

##