



Sets Ex 1.3 Q1

- (i) This set is non-empty as 10 is an even natural number divisible by 5.
- (ii) As 2 belongs to this set, so it is non-empty.
- (iii) $x^2 - 2 = 0 \Rightarrow x^2 = 2 \Rightarrow x = \pm\sqrt{2} \in \mathbb{Q}$, the set of rational numbers
So, this set is empty.
- (iv) This set is empty as there is no natural number x such that $x < 8$ and simultaneously $x > 12$.
- (v) This set is empty as any two parallel lines never intersect each other.

Sets Ex 1.3 Q2

- (i) Infinite, since with a common centre infinitely many circles can be drawn in a plane.
- (ii) Finite, as there are only 26 letters of English Alphabet.
- (iii) Infinite, $\because \{x \in \mathbb{N} : x > 5\} = \{6, 7, 8, \dots\}$ Which is infinite.
- (iv) Finite, $\because \{x \in \mathbb{N} : x, 200\} = \{1, 2, 3, \dots, 199\}$ Which is finite.
- (v) Infinite, $\because \{x \in \mathbb{Z} : x < 5\} = -\{\dots, -3, -2, -1, 0, 1, 2, 3, 4\}$ Which is infinite.
- (vi) $\{x \in \mathbb{R} : 0 < x < 1\}$ is an infinite set \because an interval is an infinite set.

Sets Ex 1.3 Q3

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

$$B = \{x \in \mathbb{R} : (x - 1)^2 = 0\}$$

$$= \{x \in \mathbb{R} : x = 1, 1\}$$

$$= \{1\}$$

$$C = \{1, 2, 3\} (\because \text{repetition is not allowed in a set})$$

$$D = \{x \in \mathbb{R} : x^3 - 6x^2 + 11x - 6 = 0\}$$

$$= \{x \in \mathbb{R} : (x - 1)(x^2 - 5x + 6) = 0\} \quad [\because x = 1 \text{ satisfies the above equation}]$$

$$= \{x \in \mathbb{R} : (x - 1)(x - 2)(x - 3) = 0\}$$

$$= \{x \in \mathbb{R} : x = 1, 2, 3\}$$

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

Hence the set A, C and D are equal.

Sets Ex 1.3 Q4

$$A = \{a, e, p, r\}$$

$$B = \{a, e, p, r\} \text{ (repetition of 'p' is not allowed)}$$

$$C = \{e, o, p, r\}$$

as $A = B \neq C$, \therefore the sets are not equal

***** END *****