



11th Class

NCERT



Chapter 1 SETS

EXERCISE 1.1

REAL NUMBERS

Natural Number 1, 2, 3, 4, 5,...

Even Number 2, 4, 6, 8, 10,...

Odd Number 1, 3, 5, 7, 9,...

Integer Number -3,-2,-1,0,1,2,

Whole Number 0, 1, 2, 3,...

Composite Number 4,6,8,9,10,...

Prime Number 2, 3, 5, 7, 11, ...

Co Prime Number (5,7), (2,3),...

7 Rational Number $\sqrt{4}, 5, \dots, 2\frac{5}{3}$

1. Which of the following are sets ? Justify your answer.

(i) The collection of all the months of a year beginning with the letter J.

Solution:- (i) The collection of all months of a year beginning with the letter J is a well-defined collection of objects because cannot change to a month that belongs to this collection by person to person.

Hence, this collection is a set.

(ii) The collection of ten most talented writers of India.

Solution:- (ii) The collection of ten most talented writers of India is not a well-defined collection because a writer's talent may be change from person to person.

Hence, this collection is not a set.

(iii) A team of eleven best-cricket batsmen of the world.

Solution:- (iii) A team of eleven best cricket batsmen of the world is not a well-defined collection because a batsman's is change talent may be from person to person.

Hence, this collection is not a set.

(iv) The collection of all boys in your class.

Solution:- **(iv)** The collection of all boys in your class is a well-defined collection because you can definitely identify a boy who belongs to this collection.

Hence, this collection is a set.

(v) The collection of all natural numbers less than 100.

Solution:- **(v)** The collection of all natural numbers less than 100 is a well-defined collection because one can definitely identify a number that belongs to this collection.

Hence, this collection is a set.

(vi) A collection of novels written by the writer Munshi Prem Chand.

Solution:- **(vi)** A collection of novels written by the writer Munshi Prem Chand is a well-defined collection because one can definitely identify a book that belongs to this collection.

Hence, this collection is a set.

(vii) The collection of all even integers.

Solution:- **(vii)** The collection of all even integers is a well-defined collection because one can definitely identify an even integer that belongs to this collection.

Hence, this collection is a set.

(viii) The collection of questions in this Chapter.

Solution:- **(viii)** The collection of questions in this chapter is a well-defined collection because one can definitely identify a question that belongs to this chapter.

Hence, this collection is a set.

(ix) A collection of most dangerous animals of the world

Solution:- **(ix)** The collection of the most dangerous animals of the world is not a well-defined collection because the criteria for determining the dangerousness of an animal can vary from person to person.

Hence, this collection is not a set

2. Let $A = \{1, 2, 3, 4, 5, 6\}$. Insert the appropriate symbol $\in$ or $\notin$ in the blank spaces:

- (i) $5 \dots A$ (ii) $8 \dots A$ (iii) $0 \dots A$ (iv) $4 \dots A$
 (v) $2 \dots A$ (vi) $10 \dots A$

Solution:-

(i) $5 \in A$ as 5 is present in set A.

(ii) $8 \notin A$ as 8 is NOT present in set A.

(iii) $0 \notin A$ as 0 is NOT present in set A.

(iv) $4 \in A$ as 4 is present in set A.

(v) $2 \in A$ as 2 is present in set A.

(vi) $10 \notin A$ as 10 is NOT present in set A.

3. Write the following sets in roster form:

(i) $A = \{x : x \text{ is an integer and } -3 \leq x < 7\}$

Solution:- (i) $A = \{-3, -2, -1, 0, 1, 2, 3, 4, 5, 6\}$

(ii) $B = \{x : x \text{ is a natural number less than 6}\}$

Solution:- (ii) $B = \{1, 2, 3, 4, 5\}$

(iii) $C = \{x : x \text{ is a two-digit natural number such that the sum of its digits is 8}\}$

Solution:- (iii) $C = \{17, 26, 35, 44, 53, 62, 71, 80\}$

(iv) $D = \{x : x \text{ is a prime number which is divisor of 60}\}$

Solution:- (iv) $D = \{2, 3, 5\}$

(v) $E =$ The set of all letters in the word TRIGONOMETRY

Solution:- (v) $E = \{T, R, I, G, O, N, M, E, Y\}$

(vi) $F =$ The set of all letters in the word BETTER

Solution:- (vi) $F = \{B, E, T, R\}$

4. Write the following sets in the set-builder form :

(i) $\{3, 6, 9, 12\}$

Solution:- $\{x : x = 3n, n \in \mathbb{N} \text{ and } 1 \leq n \leq 4\}$

(ii) $\{2, 4, 8, 16, 32\}$

Solution:- $\{x : x = 2^n, n \in \mathbb{N} \text{ and } 1 \leq n \leq 5\}$

(iii) $\{5, 25, 125, 625\}$

Solution:- $\{x : x = 5^n, n \in \mathbb{N} \text{ and } 1 \leq n \leq 4\}$

(iv) $\{2, 4, 6, \dots\}$

Solution:- $\{x : x \text{ is an even natural number}\}$

(v) $\{1, 4, 9, \dots, 100\}$

Solution:- $\{x : x = n^2, n \in \mathbb{N} \text{ and } 1 \leq n \leq 10\}$

5. List all the elements of the following sets :

(i) $A = \{x : x \text{ is an odd natural number}\}$

Solution:- $A = \{1, 3, 5, 7, 9, \dots\}$

(ii) $B = \{x : x \text{ is an integer; } -1/2 < x < 9/2\}$

Solution:- $B = \{0, 1, 2, 3, 4\}$

(iii) $C = \{x : x \text{ is an integer; We see that } x^2 \leq 4\}$

Solution:- $C = \{-2, -1, 0, 1, 2\}$

(iv) $D = \{x : x \text{ is a letter in the word "LOYAL"}\}$

Solution:- $D = \{L, O, Y, A\}$

(v) $E = \{x : x \text{ is a month of a year not having 31 days}\}$

Solution:- $E = \{\text{February, April, June, September, November}\}$

(vi) $F = \{x : x \text{ is a consonant in the English alphabet which precedes k}\}$

Solution:- $F = \{b, c, d, f, g, h, j\}$

6. Match each of the set on the left in the roster form with the same set on the right described in set-builder form:

(i) $\{1, 2, 3, 6\}$ (a) $\{x : x \text{ is a prime number and a divisor of } 6\}$

(ii) $\{2, 3\}$ (b) $\{x : x \text{ is an odd natural number less than } 10\}$

(iii) $\{M, A, T, H, E, I, C, S\}$ (c) $\{x : x \text{ is natural number and divisor of } 6\}$

(iv) $\{1, 3, 5, 7, 9\}$ (d) $\{x : x \text{ is a letter of the word MATHEMATICS}\}$

Solution:-

(i) $\{1, 2, 3, 6\}$ (c) $\{x : x \text{ is natural number and divisor of } 6\}$

(ii) $\{2, 3\}$ (a) $\{x : x \text{ is a prime number and a divisor of } 6\}$

(iii) $\{M, A, T, H, E, I, C, S\}$ (d) $\{x : x \text{ is a letter of the word MATHEMATICS}\}$

(iv) $\{1, 3, 5, 7, 9\}$ (b) $\{x : x \text{ is an odd natural number less than } 10\}$