

MATHEMATICS • CLASS 11

CHAPTER 1

Sets

NCERT SOLUTIONS



EXERCISE 1.1 — QUESTION 1

Which collections are sets? Justify each answer.

(i) All months beginning with J.

Yes. Membership is clearly decided.

{January, June, July}

(ii) The ten most talented writers of India.

No. "Most talented" depends on personal judgement.

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

No. "Best" has no fixed criterion here.

(iv) All boys in your class.

Yes. It is clear who belongs to the class.

(v) All natural numbers less than 100.

Yes. Each number can be checked using the condition.

{1, 2, 3, ..., 99}

EXERCISE 1.1 — QUESTIONS 1–2

Q1. Which collections are sets? Give reasons.

(vi) Novels written by Munshi Prem Chand.

Yes. Their authorship is definite.

(vii) All even integers.

Yes. Divisibility by 2 is definite.

$\{\dots, -4, -2, 0, 2, 4, \dots\}$

(viii) The questions in this chapter.

Yes. The chapter gives a definite collection.

(ix) The most dangerous animals in the world.

No. "Most dangerous" has no fixed criterion here.

Q2. For $A = \{1, 2, 3, 4, 5, 6\}$, fill in $\in$ or $\notin$.

(i) $5 \in A$

(ii) $8 \notin A$

(iii) $0 \notin A$

(iv) $4 \in A$

(v) $2 \in A$

(vi) $10 \notin A$

Reason: $\in$ means "is an element of";
 $\notin$ means "is not an element of".

EXERCISE 1.1 – QUESTION 3

Q3. Write each set in roster form.

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

Start at -3 ; stop before 7 .

$$A = \{-3, -2, -1, 0, 1, 2, 3, 4, 5, 6\}$$

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

Natural numbers begin at 1 here.

$$B = \{1, 2, 3, 4, 5\}$$

(iii) $C = \{x : x \text{ is a two-digit natural number whose digits sum to } 8\}$

Choose each possible nonzero tens digit.

$$C = \{17, 26, 35, 44, 53, 62, 71, 80\}$$

(iv) $D = \{x : x \text{ is prime and divides } 60\}$

$$60 = 2^2 \times 3 \times 5$$

$$D = \{2, 3, 5\}$$

EXERCISE 1.1 — QUESTIONS 3–4

Q3 (continued)

(v) E: letters in TRIGONOMETRY

The word TRIGONOMETRY has the following distinct letters:

$$E = \{T, R, I, G, O, N, M, E, Y\}$$

(vi) F: letters in BETTER

The word BETTER has the following distinct letters:

$$F = \{B, E, T, R\}$$

Q4 Write in set-builder form. In each answer $n \in \mathbb{N}$.

$$(i) \quad \{3, 6, 9, 12\} = \{x : x = 3n, 1 \leq n \leq 4\}$$

$$(ii) \quad \{2, 4, 8, 16, 32\} = \{x : x = 2^n, 1 \leq n \leq 5\}$$

$$(iii) \quad \{5, 25, 125, 625\} = \{x : x = 5^n, 1 \leq n \leq 4\}$$

$$(iv) \quad \{2, 4, 6, \dots\} = \{x : x = 2n, n \in \mathbb{N}\}$$

$$(v) \quad \{1, 4, 9, \dots, 100\} = \{x : x = n^2, 1 \leq n \leq 10\}$$

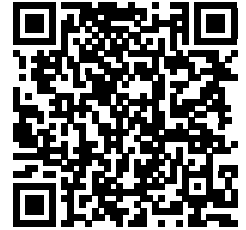


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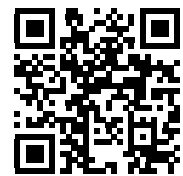


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