

Case Study Questions — Concept Summary

Case-based questions test familiar maths wrapped in a real-life story. The maths never leaves your syllabus — only the packaging changes.

What a case study question is

A short **real-world scenario** — a situation with some data, a table or a diagram — followed by two or three connected sub-questions based on it. Instead of “solve this equation”, it describes a shopkeeper, a cricket match or a garden and asks you to apply maths to *that* situation.

Where they sit in the paper

ITEM	DETAIL
Section	Section E — the case-based / competency section
How many	3 case studies, each with 2–3 sub-questions
Marks	4 marks each → 12 marks in total
Answer type	Subjective — method marks apply , so show your working

The 5-step method — use it every single time

- 1 **Read the whole scenario first**, before looking at the sub-questions. Skipping this is the number-one cause of case-study mistakes.
- 2 **Spot the maths concept**. Which chapter is this really about? Ladder against a wall → trigonometry. Savings growing each month → arithmetic progressions.
- 3 **Extract the given data**. Write the numbers down and label what each one represents. A wordy paragraph becomes an ordinary maths problem.
- 4 **Solve the sub-questions in order**. They build on each other — the first usually sets up the later ones.
- 5 **Check against the situation**. Does the answer make sense in real life? A 2 m tall building means something went wrong.

The formulas these scenarios usually need

$$\text{AP: } a_n = a + (n - 1)d \quad | \quad S_n = n/2 [2a + (n - 1)d]$$

$$\text{Heights \& distances: } \tan \theta = \text{opposite} / \text{adjacent} \quad | \quad \cos \theta = \text{adjacent} / \text{hypotenuse}$$

$$\text{Coordinate geometry: distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Key takeaways

- Section E is worth **12 marks** — three 4-mark case studies.
- The maths is **never beyond your chapters**; only the wording is unfamiliar.
- **Read fully, then extract data** — key numbers hide inside sentences.
- These are subjective questions: **write your steps** to earn method marks.
- A ten-second **sanity check** catches the errors that cost whole marks.

One Case Study, Solved Step by Step

The scenario

Riya is saving for a school trip. She saves Rs 150 in the first week, and every week after that she saves Rs 40 more than the week before.

(i) How much does she save in the 10th week? (ii) How much has she saved in total after 12 weeks?

Applying the five steps

1. Read it all	A saving that grows by the same amount every week – two questions, one about a single week, one about a total.
2. Spot concept	Equal increase each week → Arithmetic Progression . Part (i) needs a_n , part (ii) needs S_n .
3. Extract data	$a = 150$, $d = 40$, $n = 10$ for part (i), $n = 12$ for part (ii).
4. Solve in order	Shown below – part (i) first, because it confirms the pattern for part (ii).
5. Check	Cross-checked with a second formula, then tested against common sense.

The working

(i) Saving in the 10th week

$$a_{10} = a + 9d = 150 + 9 \times 40 = 150 + 360 = \text{Rs } 510$$

(ii) Total saved in 12 weeks

$$S_{12} = 12/2 [2(150) + 11(40)] = 6 [300 + 440] = 6 \times 740 = \text{Rs } 4440$$

Check. The 12th week's saving is $a_{12} = 150 + 11 \times 40 = 590$, so $S_{12} = 12/2 (150 + 590) = 6 \times 740 = 4440$. Both routes agree, and Rs 4440 over 12 weeks is a believable amount – the answer survives the sanity check.

Now try this one

A ladder leans against a wall, making an angle of 60° with the ground. Its foot is 2.5 m from the wall. How long is the ladder?

Spot the concept (trigonometry), extract the data (adjacent = 2.5 m, angle = 60°), pick the ratio that links them to the hypotenuse, and check the answer is longer than 2.5 m.

Answer: $\cos 60^\circ = 2.5 / L$, so $L = 2.5 \div 0.5 = 5$ m.

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