MATHS WITHOUT GUESSWORK · BOARD BOOSTER

Triangles

LOCK THE SURE MARKS.
STRETCH FOR THE TOP.
PRACTISE THE BOARD WAY.

A board-exam practice companion for **CBSE Class 10 Mathematics**
Syllabus session 2026–27 · Standard (041)

🛡️ Secure Track | 🚀 Stretch Track | ~130 questions + 3 mini-mocks

Built around what the board actually tests

Similarity
same shape, sides in proportion

BPT
Thales — the line that splits two sides

AA·SSS·SAS
prove two triangles similar

Original questions and solutions. Answers kept separate. Not a substitute for the NCERT textbook or your teacher.

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Triangles in the board paper

Know exactly how many marks are really at stake here — so you spend your effort where the paper pays.

◆ UNDERSTAND THE OFFICIAL NUMBER This chapter sits inside **Unit IV — Geometry, worth 15 marks**, shared with Circles — and Triangles is usually the bigger half. Expect **5–6 marks**: typically a 1-mark MCQ, a 2- or 3-mark BPT/similarity proportion, and very often a **5-mark proof** (prove two triangles similar, then a proportion). CBSE publishes weightage per unit, not per chapter.

Where those marks usually fall (PYQ trend — based on past papers, not official)

Form it takes	Typical marks	What it tests
1–2 MCQ / Assertion-Reason	1–2	Similarity criteria, BPT ratio, "are these similar?"
A VSA or SA	2–3	Find an unknown side by BPT or similarity; a short proof
A 5-mark LA	5	Prove two triangles similar (AA/SSS/SAS), then deduce a proportion
A case study	4	Shadows, maps, ramps, ladders against a wall — similar triangles in life

★ SPOT THE CLUE WHAT'S IN THE 2026–27 SCOPE The current syllabus keeps **similar triangles**, **BPT and its converse**, and the **AA, SSS, SAS criteria** (with BPT the one theorem you may be asked to *prove*). It has **dropped** the Pythagoras theorem and the area-of-similar-triangles theorem. If an old guide shows a "ratio of areas = ratio of squares of sides" question, skip it.

Q5 △ABC ~ △DEF means ∠B equals: A. ∠D B. ∠E C. ∠F D. ∠A

1 GUIDED ★

Q6 If △ABC ~ △PQR and AB/PQ = 1/2, then BC/QR = A. 1 B. 2 C. 1/2 D. 1/4

1 GUIDED ★

Q7 Two triangles are similar by the AA criterion if: A. two angles are equal B. two sides are equal C. all sides are equal D. one angle is equal

1 GUIDED ★

Q8 In △ABC, DE ∥ BC, AD = 3 cm, DB = 5 cm, AE = 4 cm. Then EC = A. 20/3 cm B. 15/4 cm C. 12/5 cm D. 6 cm

1 PART-GUIDED ★

Q9 In △ABC, DE ∥ BC, AD = 2 cm, DB = 3 cm, AE = 4 cm. Then EC = A. 6 cm B. 8/3 cm C. 3 cm D. 2 cm

1 PART-GUIDED ★

Q10 △ABC ~ △DEF with AB = 4 cm and DE = 6 cm. The scale factor of DEF to ABC is: A. 2/3 B. 3/2 C. 2 D. 1/2

1 PART-GUIDED

Q11 If two triangles are similar, their corresponding sides are: A. equal B. proportional C. perpendicular D. unrelated

1 GUIDED ★

Q12 A line parallel to one side of a triangle divides the other two sides: A. equally B. in the same ratio C. at right angles D. not at all

1 GUIDED ★

Q13 In △ABC, DE ∥ BC, AD = 6 cm, DB = 9 cm, AE = 8 cm. Then EC = A. 12 cm B. 10 cm C. 11 cm D. 16 cm

1 PART-GUIDED

Q14 The midpoint theorem (the line joining midpoints of two sides is parallel to the third) is a special case of: A. BPT B. Pythagoras C. SAS D. AAA

1 PART-GUIDED ★

Q15 △ABC ~ △DEF with ratio 2 : 3. If the perimeter of △ABC is 24 cm, the perimeter of △DEF is: A. 16 cm B. 36 cm C. 48 cm D. 12 cm

1 INDEPENDENT ★

Q16 In two similar triangles the ratio of perimeters equals the ratio of: A. areas B. corresponding sides C. angles D. altitudes squared

1 GUIDED ★

Q17 A vertical stick 6 m long casts a 4 m shadow. At the same moment a tower casts a 28 m shadow. The tower's height is: A. 42 m B. 18.7 m C. 32 m D. 48 m

1 INDEPENDENT ★

Q18 Which criterion uses one pair of equal angles *and* the including sides in the same ratio? A. AA B. SSS C. SAS D. RHS

1 GUIDED ★

Q19 If AB/DE = BC/EF = CA/FD for △ABC and △DEF, they are similar by: A. AA B. SSS C. SAS D. ASA

1 GUIDED ★

Q20 In △ABC, DE ∥ BC with AD/DB = 3/5. If AE = 6 cm, then EC = A. 10 cm B. 3.6 cm C. 9 cm D. 18 cm

1 PART-GUIDED

Q21 All _____ triangles are similar to one another: A. isosceles B. right-angled C. equilateral D. scalene

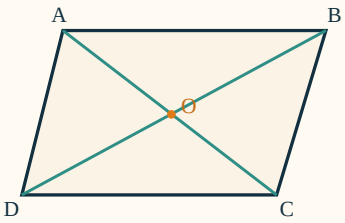
1 GUIDED ★

Triangles · Board Booster — Secure Track

1 2 3 4 5 6 Secure

Very Short Answer (2-mark) set

22 two-mark questions. Draw a quick figure, write the ratio or criterion, substitute. Worked solutions in the Answer Key.



Trapezium ABCD, AB ∥ DC. The diagonals cut at O with AO/OC = BO/OD.

Q1 In △ABC, DE ∥ BC with D on AB and E on AC. AD = 1.5 cm, DB = 3 cm, AE = 1 cm. Find EC.

2 GUIDED ★

Q2 In △ABC, DE ∥ BC with AD = 4 cm, DB = 6 cm and EC = 9 cm. Find AE.

2 GUIDED

Q3 △ABC ~ △DEF with AB = 5 cm, BC = 8 cm and DE = 7.5 cm. Find EF.

2 PART-GUIDED ★

Q4 The sides of a triangle are 3 cm, 4 cm and 6 cm. A triangle similar to it has longest side 9 cm. Find its other two sides.

2 PART-GUIDED

Q5 In △ABC, DE ∥ BC with AD = x, DB = x − 2, AE = x + 2, EC = x − 1. Find x.

2 UNFAMILIAR ★

Q6 A vertical pole 6 m high casts a 4 m shadow. At the same time a building casts a 20 m shadow. Find the building's height.

2 PART-GUIDED ★

Case studies (4-mark)

12 source-based cases, each 1 + 1 + 2 marks. Re-draw every one as two similar triangles before you compute. Solutions in the Answer Key.

Case 1 — The flagpole's shadow

4 marks

On a sunny morning a 1.5 m metre-stick stands upright and casts a 1 m shadow. Next to it, the school flagpole casts a 7 m shadow at the same moment.

(i) Why are the stick-and-shadow triangle and the pole-and-shadow triangle similar?

1

(ii) Write the proportion linking heights and shadows.

1

(iii) Find the height of the flagpole.

2

Answer Key

Kept at the back on purpose — so a parent needn't teach. The five recurring proofs are written out in full once; the drills get the key step, the answer and the likely slip.

The five model proofs (write these out once)

BPT — a line ∥ to one side divides the other two in the same ratio. *Given:* △ABC, DE ∥ BC, D on AB, E on AC. *To prove:* AD/DB = AE/EC. *Construction:* join BE and CD; draw EM ⊥ AB and DN ⊥ AC. *Proof:* area(△ADE) = ½·AD·EM and area(△BDE) = ½·DB·EM, so area(△ADE)/area(△BDE) = AD/DB. Similarly area(△ADE)/area(△CDE) = AE/EC. But △BDE and △CDE are on the same base DE and between the same parallels DE and BC, so their areas are equal. Hence AD/DB = AE/EC. **Mark the construction and the equal-area step — they carry the proof.**

Converse of BPT. If AD/DB = AE/EC, then DE ∥ BC. *Proof idea:* if DE were not parallel to BC, draw DE′ ∥ BC; by BPT AD/DB = AE′/EC, so AE′/EC = AE/EC, giving E′ = E. Hence DE ∥ BC.

Equiangular ⇒ sides proportional (AA). In △ABC and △DEF with ∠A=∠D, ∠B=∠E (so ∠C=∠F), mark P on AB and Q on AC with AP=DE, AQ=DF. Then △APQ ≅ △DEF (SAS), so ∠APQ=∠E=∠B ⇒ PQ ∥ BC ⇒ by BPT AP/PB = AQ/QC, which rearranges to AB/DE = AC/DF. Similarly AB/DE = BC/EF. ∴ sides are proportional.

Trapezium diagonals. ABCD, AB ∥ DC, diagonals meet at O. In △AOB and △COD: ∠OAB=∠OCD and ∠OBA=∠ODC (alternate angles, AB ∥ DC), so △AOB ~ △COD (AA). Hence AO/OC = BO/OD, i.e. AO/BO = CO/DO.

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- **Long Answer.** 16 five-mark questions
- **Case studies.** 12 four-mark source-based cases
- **HOTS and trickiest variations.** 15 questions
- **Timed mini-mocks and Answer Key.** 3 single-chapter mini-mocks; every question has its answer, kept at the back

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