Triangles

Write corresponding vertices in the same order. Similar triangles have the same shape, so corresponding side lengths have one common scale factor.

Formulas and methods

AA (or AAA) similarity: two corresponding equal angles suffice. SAS similarity: an included equal angle and proportional enclosing sides. SSS similarity: all three corresponding side pairs proportional.

Basic proportionality theorem (BPT): in triangle ABC, if D lies on AB, E on AC and DE ∥ BC, then AD/DB = AE/EC.

Converse BPT: if points on two sides divide those sides in the same ratio, their joining segment is parallel to the third side.

Worked examples

In triangle ABC, DE ∥ BC, AD = 3 cm, DB = 2 cm and AE = 4.5 cm. Find EC.

BPT gives 3/2 = 4.5/EC. Hence 3EC = 9 and EC = 3 cm. Notice that AD/DB compares parts, not a part with the whole side.

Explain the area proof of BPT.

Triangles ADE and BDE have the same altitude to AB, so area(ADE)/area(BDE) = AD/DB. Likewise area(ADE)/area(CDE) = AE/EC. Triangles BDE and CDE share base DE and lie between parallels DE and BC, so their areas are equal. Therefore AD/DB = AE/EC.

Common mistake

Similar does not mean congruent. Do not use SAS unless the equal angle lies between the two side pairs being compared.

Triangles — practice

Try these without looking at the answers. Show substitutions and units. Difficulty labels describe these questions, not official CBSE classifications.

1. [Foundation] Triangles ABC and PQR are similar in that order. Which side corresponds to AC?

2. [Core] Two similar triangles have corresponding sides 6 and 9 cm. A second side in the smaller triangle is 8 cm. Find its partner.

3. [Core] AD = 4, DB = 6, AE = 6, EC = 9. Are DE and BC parallel?

4. [Challenge] In triangle ABC, DE ∥ BC, AD/AB = 2/5 and BC = 15 cm. Find DE.

Triangles — answers

1. Triangles ABC and PQR are similar in that order. Which side corresponds to AC?

PR; correspondence is A ↔ P, B ↔ Q, C ↔ R.

2. Two similar triangles have corresponding sides 6 and 9 cm. A second side in the smaller triangle is 8 cm. Find its partner.

Scale factor = 9/6 = 3/2. Partner = 8 × 3/2 = 12 cm.

3. AD = 4, DB = 6, AE = 6, EC = 9. Are DE and BC parallel?

4/6 = 6/9 = 2/3. By converse BPT, DE ∥ BC.

4. In triangle ABC, DE ∥ BC, AD/AB = 2/5 and BC = 15 cm. Find DE.

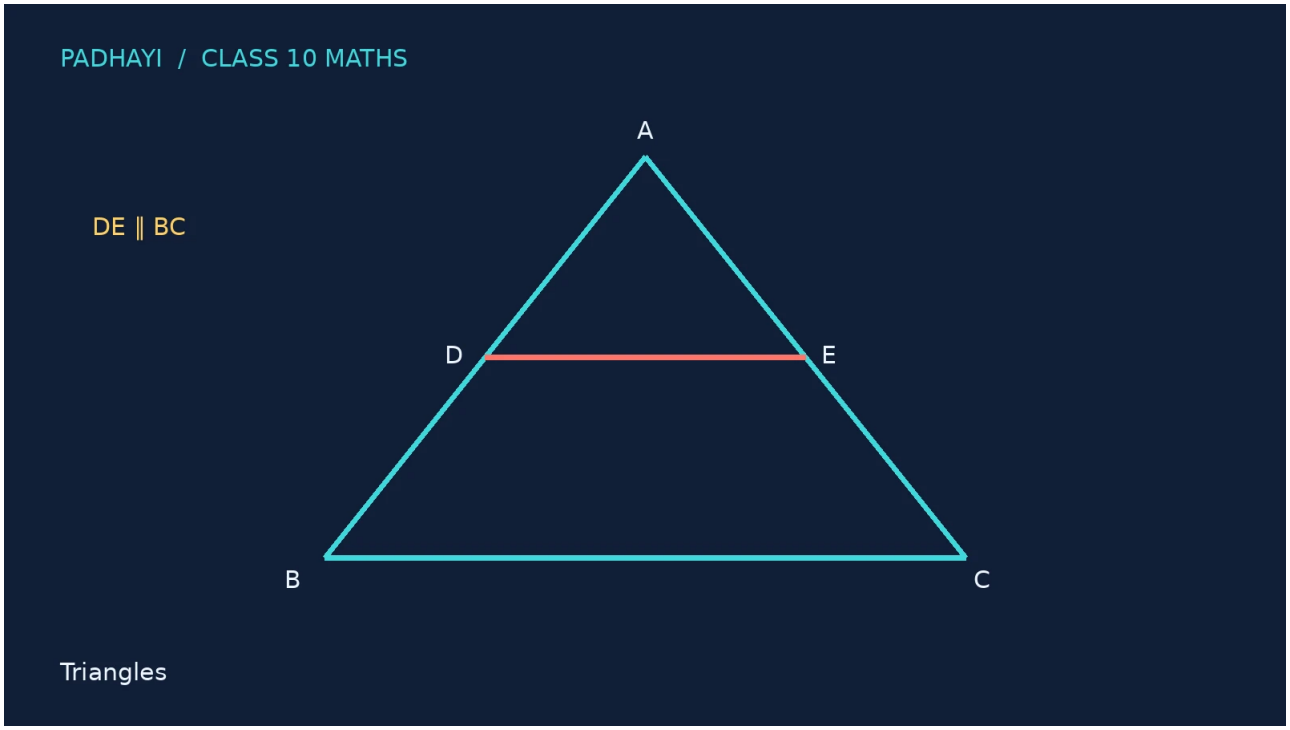
Triangles ADE and ABC are similar. DE/BC = AD/AB = 2/5, so DE = 6 cm.

Next step: explain one method aloud, then solve a question from your NCERT textbook without using this sheet.

Original Padhayi revision material. Independent study aid; not an official CBSE or NCERT publication. Syllabus reference: CBSE Mathematics, Class X, 2026–27.

Official CBSE syllabus | NCERT textbooks

Visual reminder



Schematic illustration; diagrams are not necessarily drawn to scale.