

# Class 10 Mathematics – TRIANGLES

## Complete Notes for Full Marks

This PDF contains complete chapter notes for Class 10 Triangles based on the NCERT syllabus. It includes every important theorem, definitions, formulas, criteria, shortcuts, solved concepts, common mistakes, and exam tips required to score full marks.

### 1. Introduction to Similarity

- Congruent figures have same shape and same size.
- Similar figures have same shape but may have different sizes.
- All congruent figures are similar, but all similar figures are not congruent.
- All circles are similar.
- All squares are similar.
- All equilateral triangles are similar.

### 2. Conditions for Similar Polygons

- Corresponding angles must be equal.
- Corresponding sides must be proportional.
- Both conditions are necessary.
- Only equal angles are NOT enough.
- Only proportional sides are NOT enough.

### 3. Similarity of Triangles

- Two triangles are similar if:
  - Corresponding angles are equal.
  - Corresponding sides are proportional.
- Symbol used for similarity:  $\sim$
- Correct order of vertices is extremely important.

### 4. Basic Proportionality Theorem (BPT) / Thales Theorem

- Statement: If a line is drawn parallel to one side of a triangle to intersect the other two sides, then the two sides are divided in the same ratio.
- Formula:  $AD/DB = AE/EC$
- Condition: DE must be parallel to BC.
- Very important theorem for board exams.

## 5. Converse of BPT

- Statement: If a line divides two sides of a triangle in the same ratio, then the line is parallel to the third side.
- Formula:  $AD/DB = AE/EC$  implies  $DE \parallel BC$
- Used to prove parallel lines.

## 6. Criteria for Similarity of Triangles

- AAA Similarity Criterion: If corresponding angles are equal, triangles are similar.
- AA Similarity Criterion: If two angles are equal, triangles are similar.
- SSS Similarity Criterion: If corresponding sides are proportional, triangles are similar.
- SAS Similarity Criterion: If one angle is equal and including sides are proportional, triangles are similar.
- RHS Similarity Criterion (important note): In right triangles, if hypotenuse and one side are proportional, triangles are similar.

## 7. Properties of Similar Triangles

- Corresponding angles are equal.
- Corresponding sides are proportional.
- Ratio of areas = square of ratio of corresponding sides.
- Corresponding medians are proportional.
- Corresponding altitudes are proportional.
- Corresponding angle bisectors are proportional.

## 8. Important Formula Summary

- $AD/DB = AE/EC$
- $AB/DE = BC/EF = AC/DF$
- Area ratio = (Side ratio)<sup>2</sup>
- If triangles are similar, then corresponding sides are always proportional.

## 9. Common Board Exam Proofs

- Proving triangles similar using AA, SSS, or SAS.
- Using BPT to find unknown lengths.
- Using converse of BPT to prove parallel lines.
- Using similar triangles in shadow problems.
- Using similar triangles in height and distance problems.

## 10. Solving Tips

- Always write corresponding vertices correctly.
- Write theorem name beside each step.
- Use proper ratios carefully.
- Never skip reasons in proofs.
- Draw neat diagrams.
- Check whether lines are parallel before applying BPT.

## 11. Common Mistakes Students Make

- Writing incorrect correspondence order.
- Applying BPT without parallel lines.
- Mixing side ratios incorrectly.
- Forgetting to mention similarity criterion.
- Using wrong triangles for proportionality.

## 12. High Weightage Questions

- Proofs based on BPT.
- Similarity criterion problems.
- Finding missing sides using proportionality.
- Shadow and height problems.
- Median and altitude similarity problems.

## 13. One-Line Revision Notes

- Similar figures → Same shape.
- Congruent figures → Same shape and same size.
- BPT requires a parallel line.
- AA, AAA, SAS, and SSS are major similarity criteria.
- Corresponding sides of similar triangles are proportional.

## 14. Last Minute Revision Checklist

- Learn all theorem statements exactly.
  - Practice at least 5 proofs.
  - Memorize similarity criteria.
  - Practice diagram-based questions.
  - Revise formulas daily.
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**Board Exam Strategy:**

1. Attempt theorem questions neatly.
2. Mention theorem names clearly.
3. Draw diagrams with labels.
4. Keep proportionality steps aligned properly.
5. Underline final answers.
6. Practice NCERT examples and exercises thoroughly.

**Final Note:**

If you master all the theorems, similarity criteria, and NCERT examples from this chapter, you can confidently score full marks in Triangles for CBSE Class 10 examinations.