

**CBSE Class 10 Maths Notes Chapter 6:** In CBSE Class 10 Maths Notes Chapter 6, you'll learn all about triangles. Triangles are basic shapes in geometry, and this chapter teaches you everything about them. You'll learn how to classify triangles based on their sides and angles.

You'll also study important theorems like the Pythagoras theorem and properties of special triangles like equilateral, isosceles, and scalene triangles. With easy-to-understand explanations and examples, you'll learn how to identify different types of triangles and understand their properties.

The chapter also covers the concept of similarity of triangles, which helps you understand how triangles can be proportional to each other. By studying this chapter well, you'll build a strong foundation in geometry that will help you in higher classes.

## **CBSE Class 10 Maths Notes Chapter 6 Triangles PDF**

You can find the PDF for Chapter 6 "Triangles" of CBSE Class 10 Maths Notes by clicking on the link provided.

By using this PDF guide, you can better understand triangle geometry concepts, which will help you improve your problem-solving abilities in geometry.

### **CBSE Class 10 Maths Notes Chapter 6 Triangles PDF**

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### **What Is a Triangle?**

A triangle is a polygon characterized by three angles and three sides. The sum of the interior angles of a triangle always equals 180 degrees, while the sum of the exterior angles equals 360 degrees. Triangles are classified into different types based on the measures of their angles and the lengths of their sides.

### **Types of Triangles**

Here are the types of triangles:

1. Scalene Triangle: A triangle with three sides of different lengths.
2. Isosceles Triangle: A triangle with at least two sides of equal length.
3. Equilateral Triangle: A triangle with all three sides of equal length and all three angles measuring 60 degrees.
4. Acute Triangle: A triangle with all angles measuring less than 90 degrees.
5. Right Triangle: A triangle with one angle measuring exactly 90 degrees.
6. Obtuse Triangle: A triangle with one angle measuring more than 90 degrees.

## Similarity Criteria of Two Polygons Having the Same Number of Sides

Two polygons with the same number of sides are considered similar if:

1. Their corresponding angles are equal.
2. Their corresponding sides are in the same ratio or proportion.

## Similarity Criteria of Triangles

To determine if two triangles are similar, several criteria can be applied:

1. Side-Side-Side (SSS) Similarity Criterion: When the corresponding sides of two triangles are in the same ratio, their corresponding angles are also equal, indicating similarity.
2. Angle-Angle-Angle (AAA) Similarity Criterion: If the corresponding angles of two triangles are equal, their corresponding sides will be in the same ratio, demonstrating similarity.
3. Angle-Angle (AA) Similarity Criterion: When two angles of one triangle are equal to two angles of another triangle, the triangles are considered similar.
4. Side-Angle-Side (SAS) Similarity Criterion: If one angle of a triangle is equal to one angle of another triangle, and the sides including these angles are in the same ratio, the triangles are deemed similar.

## Basic Proportionality Theorem

In Mathematics, the basic proportionality theorem states that “If a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio.”

Now, let us understand the Basic proportionality theorem with the help of a diagram.

Consider the triangle ABC, as depicted in the diagram. We draw a line PQ parallel to the side BC of ABC and intersect the sides AB and AC in P and Q, respectively.

Thus, according to the Basic proportionality theorem,

$$AP/PB = AQ/QC$$

## Areas of Similar Triangles

According to the area of similar triangles theorem, when two triangles are similar, the ratio of their areas is proportional to the square of the ratio of their corresponding sides.

For instance, consider two triangles  $\triangle ABC$  and  $\triangle PQR$ :

Therefore, based on the area of similar triangles theorem, we can express:

$$\text{Area of triangle ABC} / \text{Area of Triangle PQR} = (AB/PQ)^2 = (BC/QR)^2 = (CA/RP)^2$$

## Proof of Pythagoras Theorem

**Statement:** As per **Pythagoras theorem**, “In a right-angled triangle, the sum of squares of two sides of a right triangle is equal to the square of the hypotenuse of the triangle.”

### Pythagoras Theorem Formula

According to the Pythagoras theorem, the formula is stated as follows:

$$\text{Hypotenuse}^2 = \text{Base}^2 + \text{Perpendicular}^2$$

Now, consider the right triangle given below.

Here, the side AC is the hypotenuse, which is the opposite of the right angle. It is the longest side of a right triangle.

The side AB is the base, which is the side adjacent to angle A.

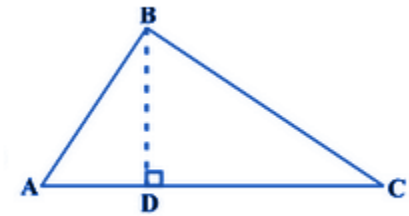
The BC is perpendicular, which is the side opposite to angle A.

### Proof –

Consider the right triangle, right-angled at B.

Construction-

Draw  $BD \perp AC$



Now,  $\triangle ADB \sim \triangle ABC$

So,  $AD/AB = AB/AC$

or  $AD \cdot AC = AB^2$  .....(i)

Also,  $\triangle BDC \sim \triangle ABC$

So,  $CD/BC = BC/AC$

or,  $CD \cdot AC = BC^2$  .....(ii)

Adding (i) and (ii),

$$AD \cdot AC + CD \cdot AC = AB^2 + BC^2$$

$$AC(AD + DC) = AB^2 + BC^2$$

$$AC(AC) = AB^2 + BC^2$$

$$\Rightarrow AC^2 = AB^2 + BC^2$$

Hence, proved.

## Benefits of CBSE Class 10 Maths Notes Chapter 6 Triangles

Benefits of studying CBSE Class 10 Maths Notes Chapter 6 Triangles:

**Conceptual Understanding:** The chapter helps students grasp the fundamental concepts of triangles, including their properties and classifications, laying a strong foundation for further geometric studies.

**Practical Application:** Understanding triangle properties helps in various real-life scenarios, such as construction, architecture, and geometry-based problem-solving.

**Enhances Problem-Solving Skills:** By solving problems related to triangles, students develop critical thinking and problem-solving abilities, which are essential in mathematics and other subjects.

**Preparation for Competitive Exams:** Competitions like Olympiads, SAT, and other entrance exams often include questions related to triangles. Mastering this chapter equips students to tackle such questions effectively.