

# Triangles

MonoMath.com - Ajay Yadav

Triangles

Board:

**CBSE |**

Class:

Class 9

Comprehensive study notes for

Triangles

by

Ajay Yadav

(Math King of Katargam). Master every concept with clear explanations, solved examples, and practice problems.

Key Concepts

Congruence of Triangles

Two triangles are

congruent

if they have the same shape and size. Corresponding parts of congruent triangles are equal (CPCT).

## SSS Congruence

If three sides of one triangle are equal to the three corresponding sides of another triangle, the triangles are congruent (SSS Rule)

.

## SAS Congruence

If two sides and the included angle of one triangle are equal to the corresponding sides and included angle of another triangle, the triangles are congruent

(SAS Rule)

.

## ASA Congruence

If two angles and the included side of one triangle are equal to the corresponding angles and side of another, the triangles are congruent

(ASA Rule)

.

## RHS Congruence

If the hypotenuse and one leg of a right triangle are equal to the hypotenuse and corresponding leg of another right triangle, they are congruent

(RHS Rule)

.

Inequalities in Triangles

In a triangle: (i) The sum of any two sides is greater than the third side. (ii) The angle opposite the longer side is larger.

(iii) The side opposite the larger angle is longer.

Important Formulas

## SSS

$AB = DE, BC = EF, CA = FD \Rightarrow \triangle ABC \cong \triangle DEF$

## SAS

$AB = DE, \angle A = \angle D, AC = DF \Rightarrow \triangle ABC \cong \triangle DEF$

## ASA

$\angle A = \angle D, AB = DE, \angle B = \angle E \Rightarrow \triangle ABC \cong \triangle DEF$

## RHS

$\angle B = \angle E = 90^\circ, AC = DF$  (hypotenuse),  $AB = DE \Rightarrow \triangle ABC \cong \triangle DEF$

Triangle Inequality

**$AB + BC > AC, AB + AC > BC, BC + AC > AB$**

Solved Examples

Example 1:

In  $\triangle ABC$ ,  $AB = AC$  and  $\angle B = 50^\circ$ . Find  $\angle A$  and  $\angle C$ .

Solution:

$AB = AC \Rightarrow \angle C = \angle B = 50^\circ$  (angles opposite equal sides).  $\angle A = 180 - (50+50) =$

$80^\circ$

Example 2:

Check if a triangle can have sides 3 cm, 4 cm, 8 cm.

Solution:

$3 + 4 = 7 < 8$ . Since sum of two sides is NOT greater than the third side,

No

, such a triangle is not possible.

Example 3:

In  $\triangle ABC$ ,  $\angle A = 80^\circ$  and  $AB = AC$ . Find  $\angle B$ .

Solution:

**$AB = AC \Rightarrow \angle B = \angle C. \angle A + \angle B + \angle C = 180 \Rightarrow 80 + 2\angle B = 180 \Rightarrow$**

$\angle B = 50^\circ$

Practice Questions

In  $\triangle ABC$ ,  $\angle A = 40^\circ$  and  $\angle B = 60^\circ$ . Which side is the longest?

Prove that the angles opposite equal sides of a triangle are equal.

Show that  $\triangle ABC \cong \triangle DEF$  using SAS rule given  $AB = DE, AC = DF, \angle A = \angle D$ .

Two sides of a triangle are 5 cm and 8 cm. What can be the range of the third side?

In  $\triangle ABC$ ,  $AB > AC$  and  $\angle B = 40^\circ$ . Which angle is larger:  $\angle C$  or  $\angle B$ ?

Download PDF

[Click here to download the PDF notes for this chapter. \(Coming soon\)](#)

Video Lessons

Watch video explanations on our [Videos page](#).