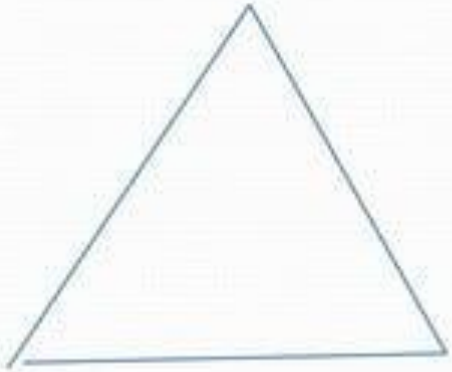
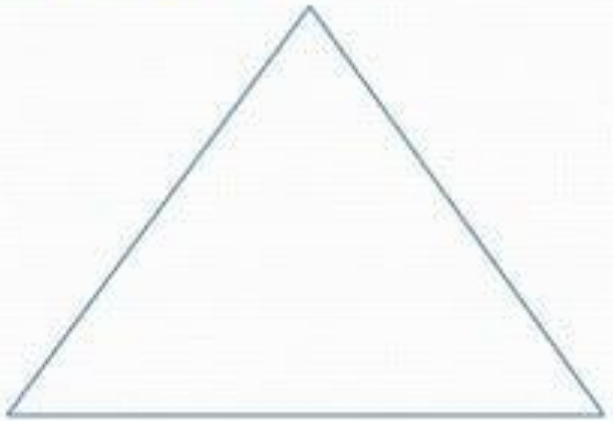
MATHS POWER POINT PRESENTATION ON

TRIANGLES

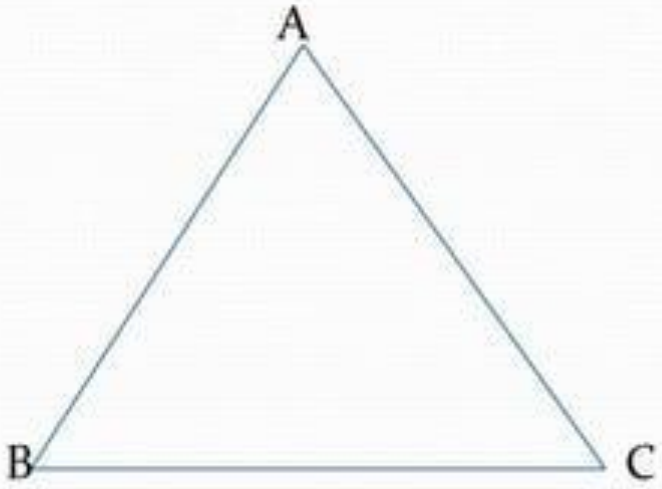
by- Manisha
CLASS:- X





Introduction

We know that a closed figure formed by three intersecting lines is called a triangle('Tri' means 'three').A triangle has three sides, three angles and three vertices. For e.g.-in Triangle ABC, denoted as ΔABC AB,BC,CA are the three sides, $\angle A, \angle B, \angle C$ are three angles and A,B,C are three vertices.



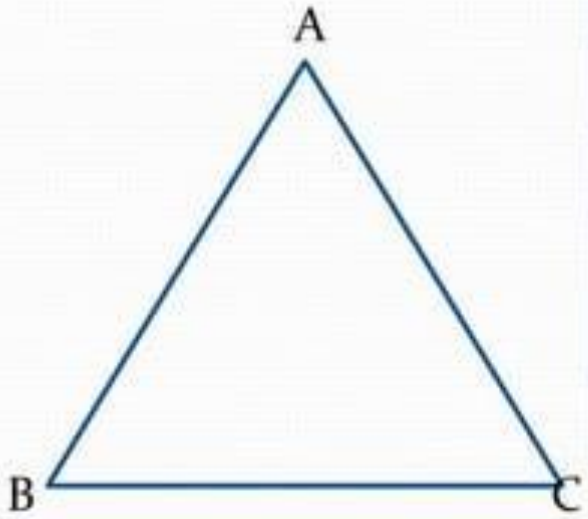
OBJECTIVES IN THIS LESSON

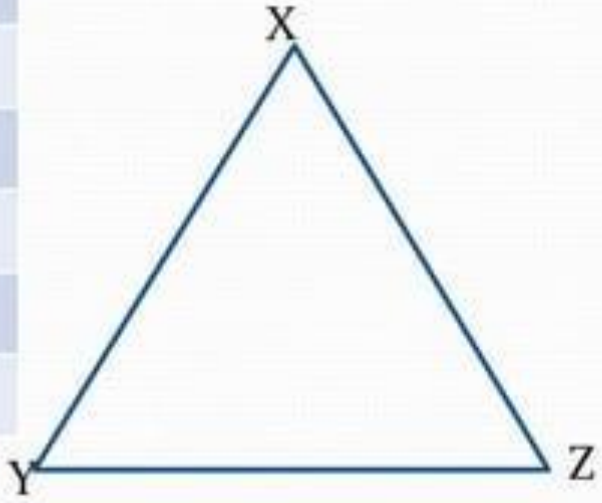
1. •DEFINE THE CONGRUENCE OF TRIANGLE.
2. • STATE THE CRITERIA FOR THE CONGRUENCE OF TWO TRIANGLES.
3. • SOME PROPERTIES OF A TRIANGLE.
4. • INEQUALITIES IN A TRIANGLE.

DEFINING THE CONGRUENCE OF TRIANGLE:-

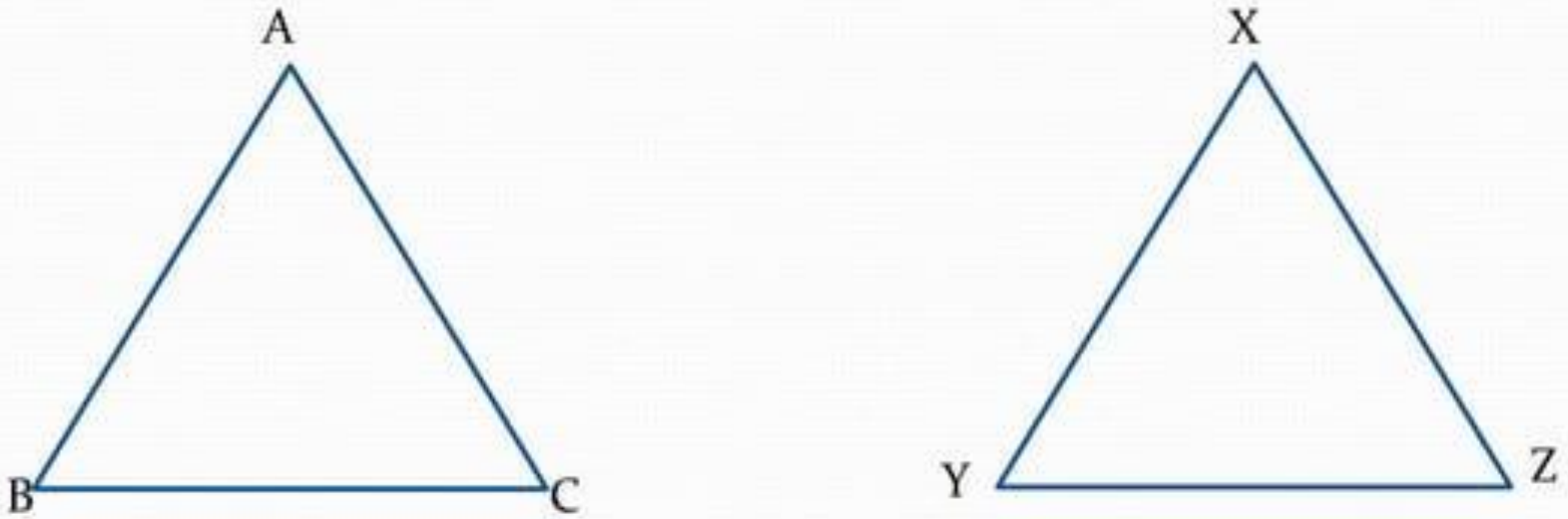
Let us take ΔABC and ΔXYZ such that corresponding angles are equal and corresponding sides are equal :-

CORRESPONDING PARTS
∠A=∠X
∠B=∠Y
∠C=∠Z
AB=XY
BC=YZ
AC=XZ





Now we see that sides of ΔABC coincides with sides of ΔXYZ.



Here, $\Delta ABC \cong \Delta XYZ$

TWO TRIANGLES ARE CONGRUENT, IF ALL THE SIDES AND ALL THE ANGLES OF ONE TRIANGLE ARE EQUAL TO THE CORRESPONDING SIDES AND ANGLES OF THE OTHER TRIANGLE.

This also means that:-

A corresponds to X
B corresponds to Y
C corresponds to Z

For any two congruent triangles the corresponding parts are equal and are termed as:-

CPCT – Corresponding Parts of Congruent Triangles

CRITERIAS FOR CONGRUENCE OF TWO TRIANGLES

SAS(side-angle-side) congruence

- Two triangles are congruent if two sides and the included angle of one triangle are equal to the two sides and the included angle of other triangle.

ASA(angle-side-angle) congruence

- Two triangles are congruent if two angles and the included side of one triangle are equal to two angles and the included side of other triangle.

AAS(angle-angle-side) congruence

- Two triangles are congruent if any two pairs of angle and one pair of corresponding sides are equal.

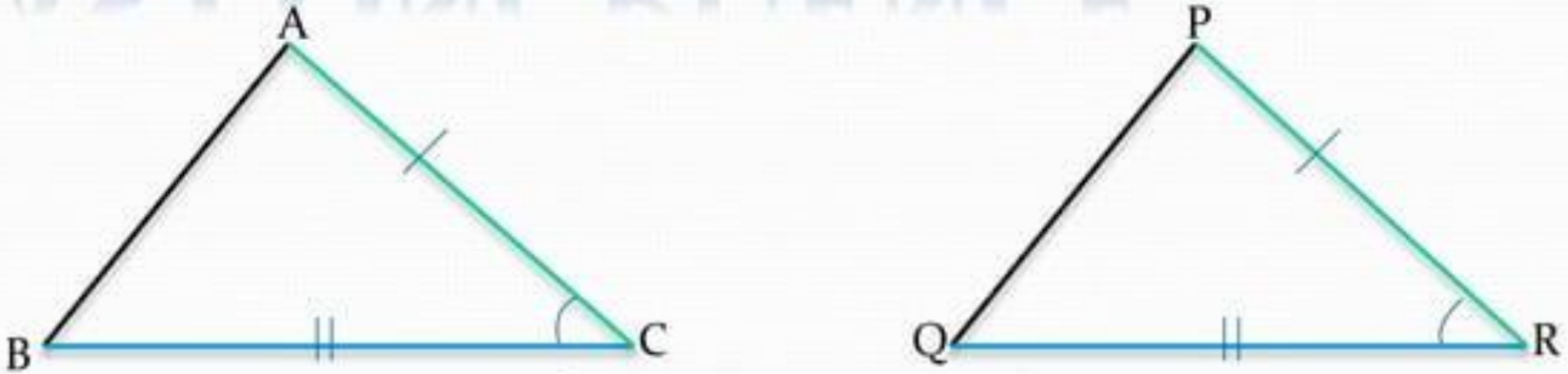
SSS(side-side-side) congruence

- If three sides of one triangle are equal to the three sides of another triangle, then the two triangles are congruent.

RHS(right angle-hypotenuse-side) congruence

- If in two right-angled triangles the hypotenuse and one side of one triangle are equal to the hypotenuse and one side of the other triangle, then the two triangles are congruent.

SAS CONGRUENCE-

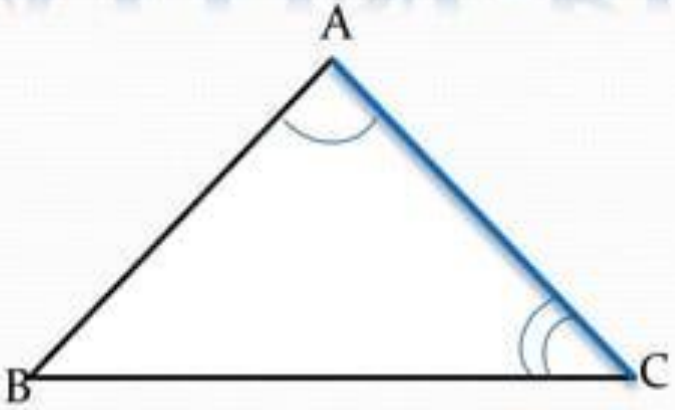


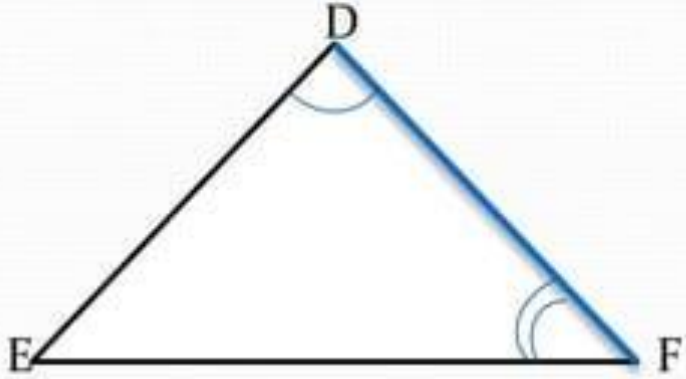
Now If,

S(1)	AC = PQ
A(2)	∠C = ∠R
S(3)	BC = QR

Then $\Delta ABC \cong \Delta PQR$ (by SAS congruence)

ASA CONGRUENCE-



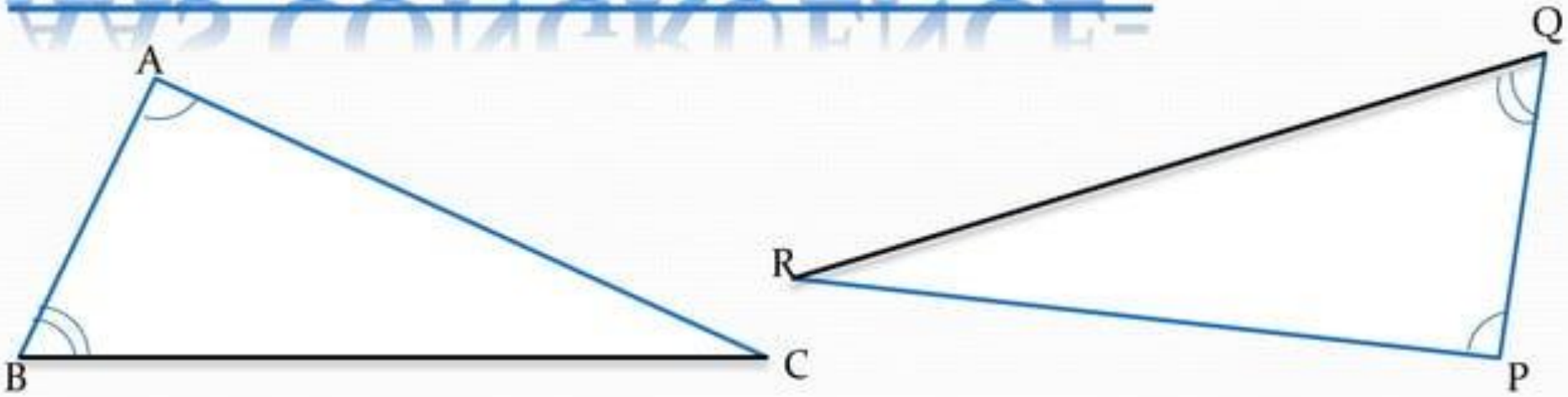


Now If,

A(1)	∠BAC = ∠EDF
S(2)	AC = DF
A(3)	∠ACB = ∠DFE

Then ΔABC ≅ ΔDEF (by ASA congruence)

AAS CONGRUENCE-

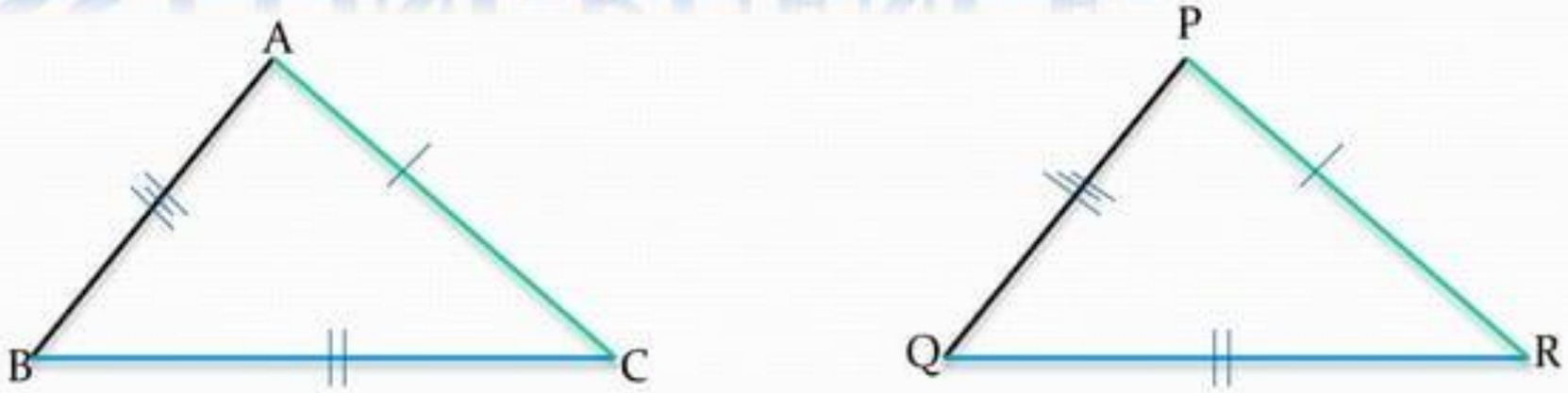


Now If,

A(1)	∠BAC = ∠QPR
A(2)	∠CBA = ∠RQP
S(3)	BC = QR

Then $\Delta ABC \cong \Delta PQR$ (by AAS congruence)

SSS CONGRUENCE-

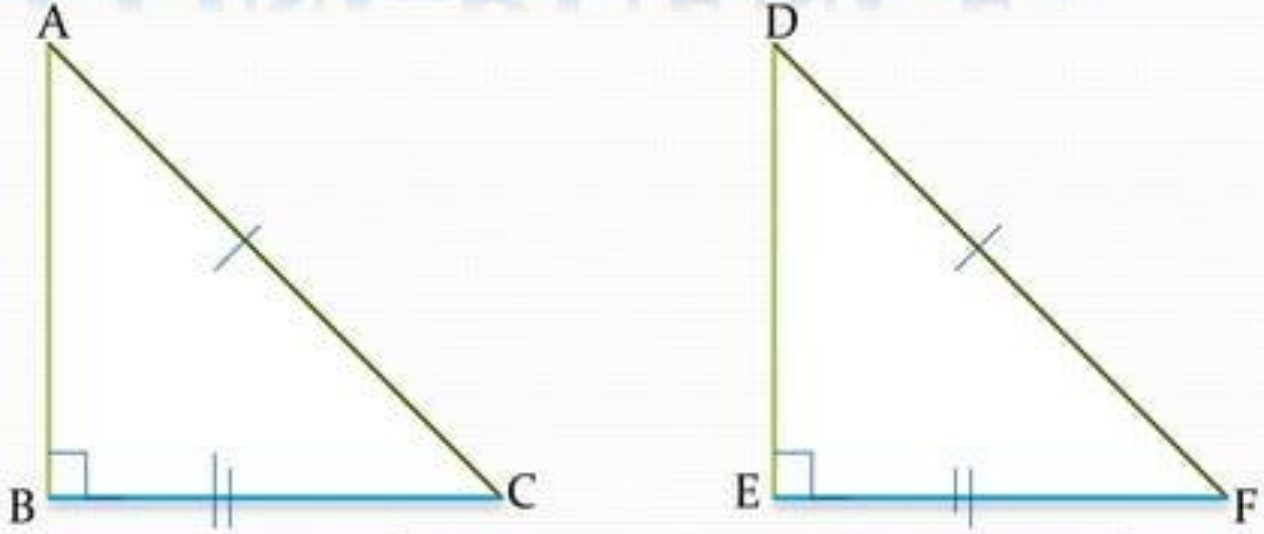


Now If,

S(1)	AB = PQ
S(2)	BC = QR
S(3)	CA = RP

Then $\Delta ABC \cong \Delta PQR$ (by SSS congruence)

RHS CONGRUENCE-

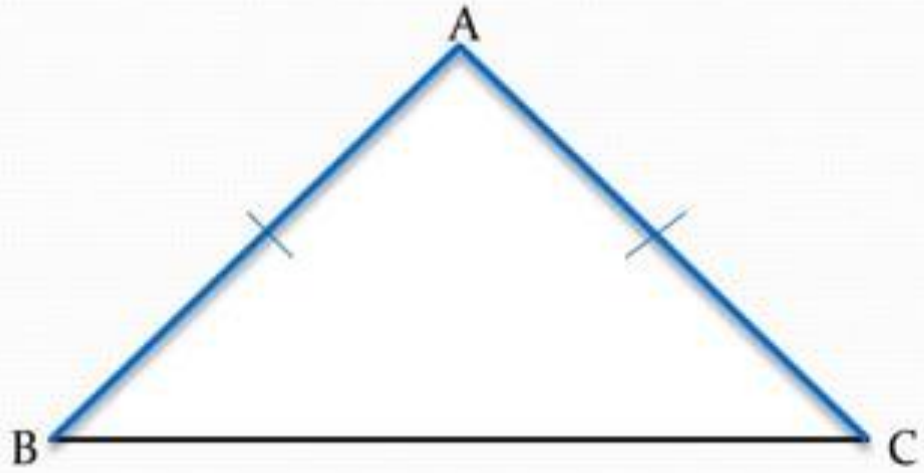


Now If,

R(1)	∠ABC = ∠DEF = 90°
H(2)	AC = DF
S(3)	BC = EF

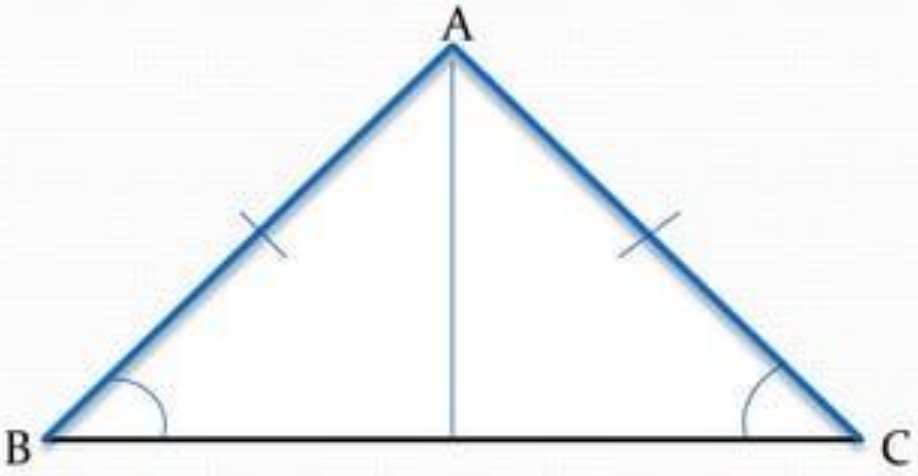
Then ΔABC ≅ ΔDEF (by RHS congruence)

PROPERTIES OF TRIANGLE



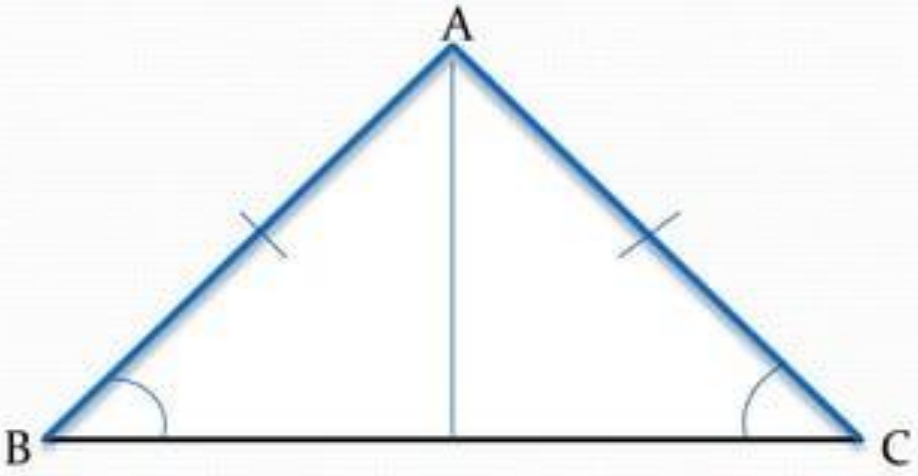
A Triangle in which two sides are equal in length is called **ISOSCELES TRIANGLE.** So, ΔABC is a isosceles triangle with $AB = BC$.

Angles opposite to equal sides of an isosceles triangle are equal.



Here, $\angle ABC = \angle ACB$

The sides opposite to equal angles of a triangle are equal.

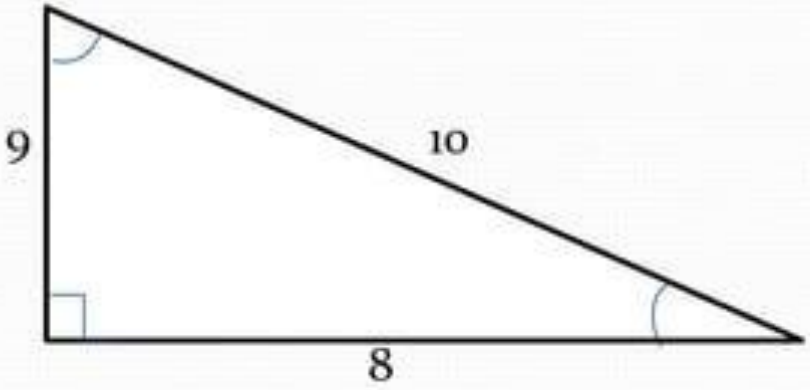


Here, AB = AC

INEQUALITIES IN A TRIANGLE

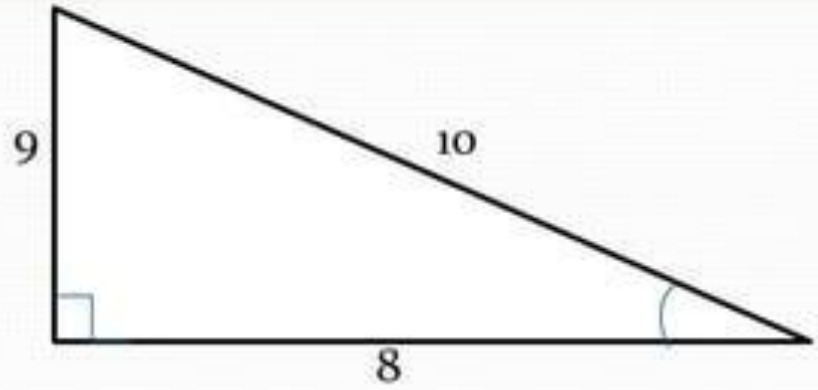
Theorem on inequalities in a triangle

If two sides of a triangle are unequal, the angle opposite to the longer side is larger (or greater)



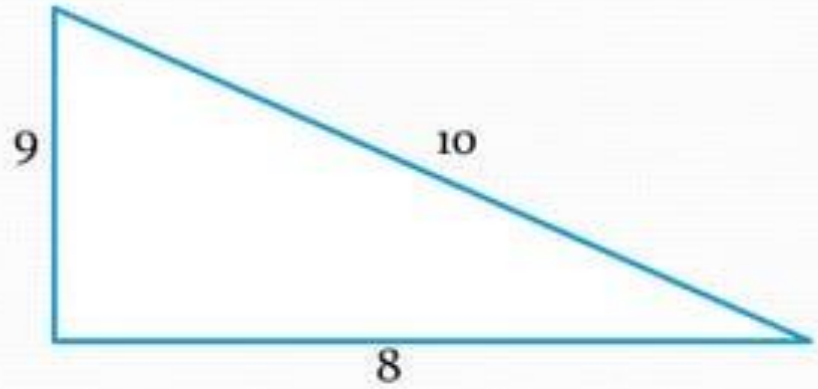
Here, by comparing we will get that-
Angle opposite to the longer side(10) is greater(i.e. 90°)

In any triangle, the side opposite to the longer angle is longer.



Here, by comparing we will get that-
Side(i.e. 10) opposite to longer angle (90°) is longer.

The sum of any two side of a triangle is greater than the third side.



Here by comparing we get-

$9+8>10$

$8+10>9$

$10+9>8$

So, sum of any two sides is greater than the third side.

SUMMARY

1.Two figures are congruent, if they are of the same shape and size.
2.If two sides and the included angle of one triangle is equal to the two sides and the included angle then the two triangles are congruent(by SAS).
3.If two angles and the included side of one triangle are equal to the two angles and the included side of other triangle then the two triangles are congruent(by ASA).
4.If two angles and the one side of one triangle is equal to the two angles and the corresponding side of other triangle then the two triangles are congruent(by AAS).
5.If three sides of a triangle is equal to the three sides of other triangle then the two triangles are congruent(by SSS).
6.If in two right-angled triangle, hypotenuse one side of the triangle are equal to the hypotenuse and one side of the other triangle then the two triangle are congruent.(by RHS)
7.Angles opposite to equal sides of a triangle are equal.
8.Sides opposite to equal angles of a triangle are equal.
9.Each angle of equilateral triangle are 60°
10.In a triangle, angles opposite to the longer side is larger
11.In a triangle, side opposite to the larger angle is longer.
12.Sum of any two sides of triangle is greater than the third side.

THANK YOU