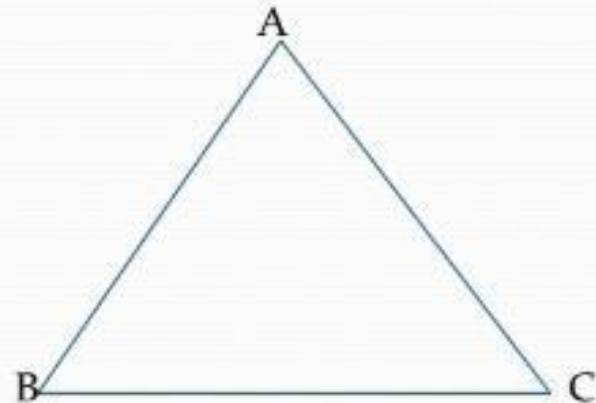# CLASS - IX

TRIANGLES

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 $\triangle ABC$ AB,BC,CA are the three sides, $\angle A,\angle B,\angle C$ are three angles and A,B,C are three vertices.
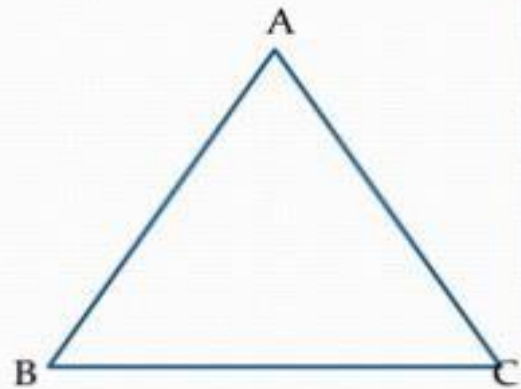
OBJECTIVES IN THIS LESSON

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 :-

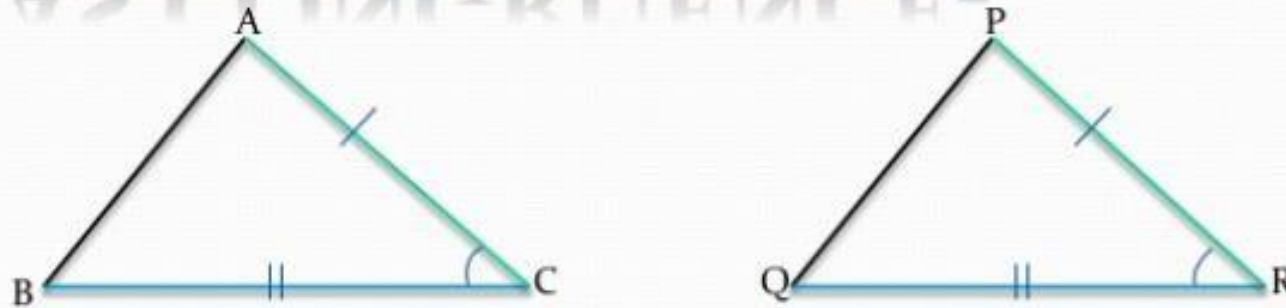| CORRESPONDING PARTS |
| --- |
| ∠A=∠X |
| ∠B=∠Y |
| ∠C=∠Z |
| AB=XY |
| BC=YZ |
| AC=XZ |
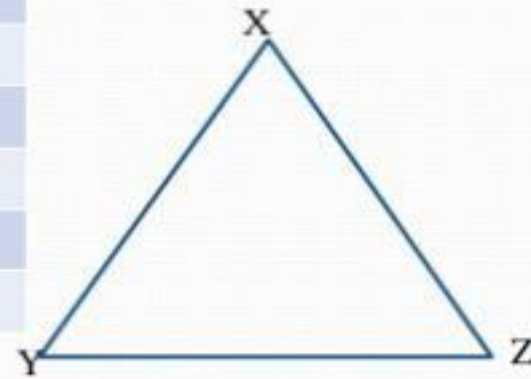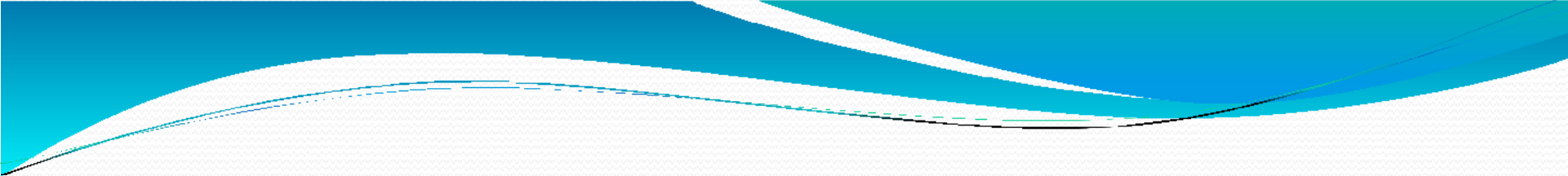
WE CAN SAY THAT TWO TRIANGLES ARE CONGRUENT IF ALL THE ANGLES AND ALL THE SIDES OF ONE TRIANGLE ARE EQUAL TO THE CORRESPONDING ANGLES AND CORRESPONDING SIDES OF ANOTHER TRIANGLE.

FOR ANY TWO CONGRUENT TRIANGLES CORRESPONDING PARTS ARE EQUAL AND ARE TERMED AS :
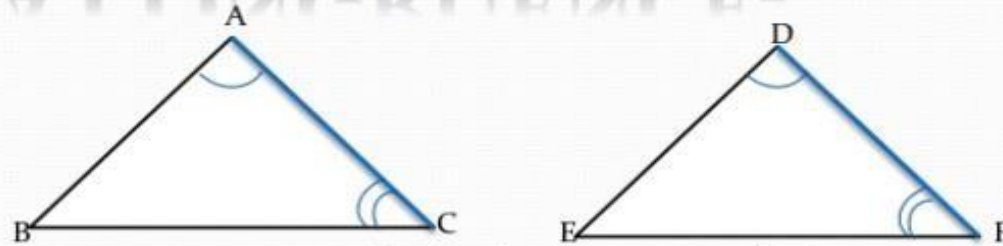CORRESPONDING PARTS OF CONGRUENT TRIANGLES **(CPCT)**

SAS CONGRUENCE-

Now If,

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

Then ΔABC ≅ ΔPQR (by SAS congruence)

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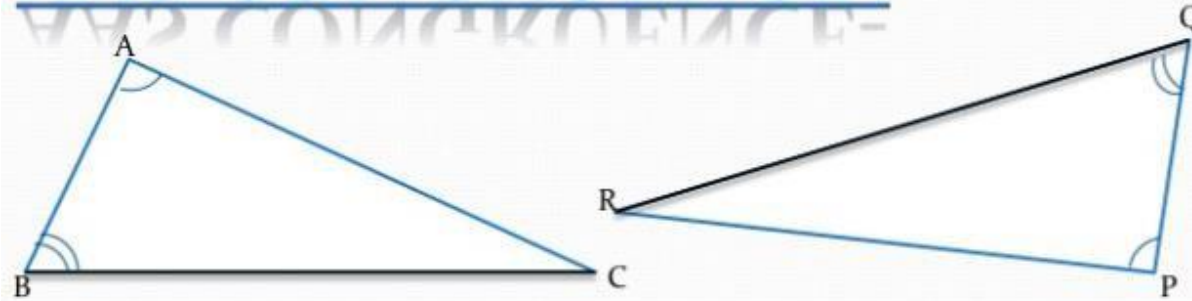
ASA CONGRUENCE-

Now If,

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

Then △ABC ≅ △DEF (by ASA congruence)

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

AAS CONGRUENCE-

Now If,

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

Then ΔABC ≅ ΔPQR (by AAS congruence)

If two angles and the non-included side of one triangle are equal to the corresponding angles and side of another triangle, the triangles are congruent.
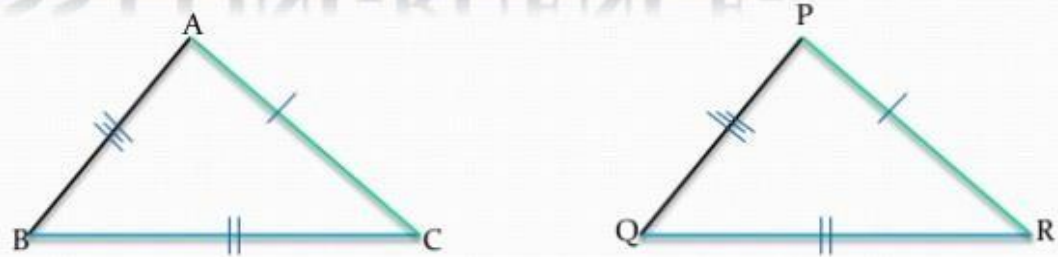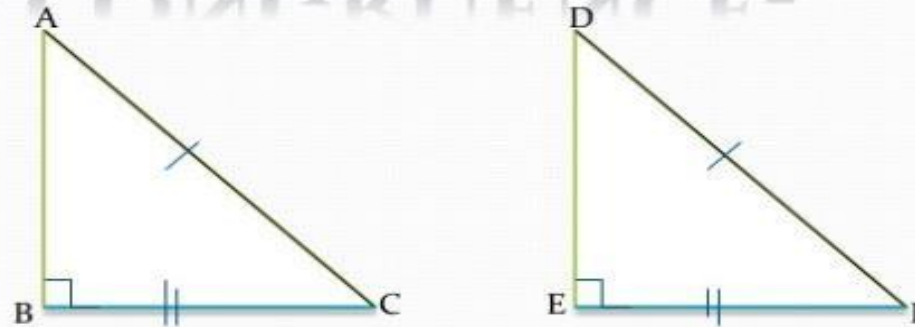
SSS CONGRUENCE-

Now If,

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

Then ΔABC ≅ ΔPQR (by SSS congruence)

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

RHS CONGRUENCE-

Now If,

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

Then ΔABC ≅ ΔDEF (by RHS congruence)

If the hypotenuse and one leg of one right-angled triangle are equal to the corresponding hypotenuse and leg of another right-angled triangle, the two triangles are congruent.