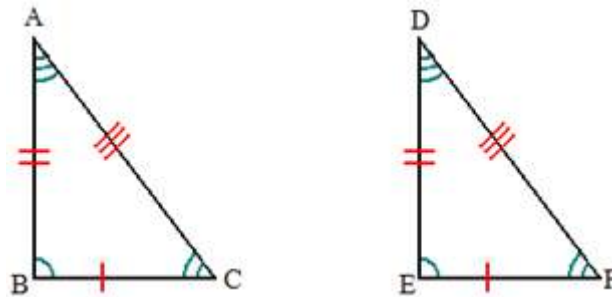


Triangles

Congruence of Triangles

Congruent Triangles

- In a pair of triangles if all three corresponding sides and three corresponding angles are exactly equal, then the triangles are said to be congruent.



Congruent triangles

In congruent triangles, the corresponding parts are equal and are written as CPCT (Corresponding part of congruent triangle).

Criteria for Congruency

SSS Criteria for Congruency

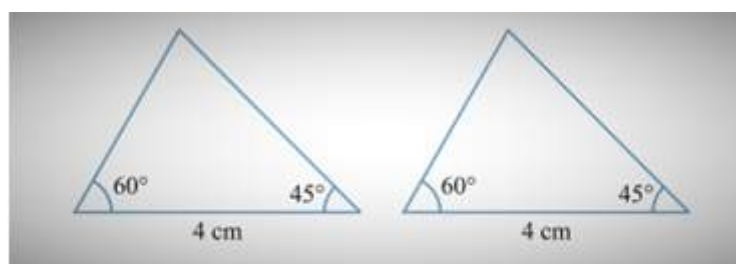
- If three sides of one triangle are equal to the three sides of another triangle, then the two triangles are congruent.
- If all sides are exactly same, then their corresponding angles must also be exactly same.

SAS Criteria for Congruency

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

ASA Criteria for Congruency

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



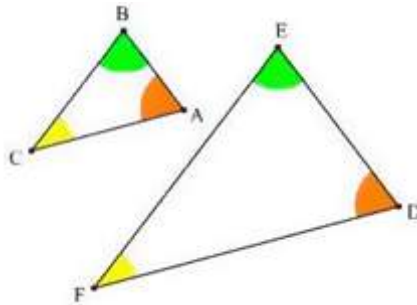
Included side is 4cm

AAS Criteria for Congruency

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

Why SSA and AAA congruency rules are not valid?

- SSA or ASS test is not a valid test for congruency as the angle is not included between the pairs of equal sides.-
- The AAA test also is not a valid test as even though 2 triangles can have all three same angles, the sides can be of differing lengths. This becomes a test for similarity (AA).



Angles of a triangle

RHS Criteria for Congruency

- If in two right 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.
- RHS stands for Right angle - Hypotenuse - Side.

Properties of Isosceles triangle

- If 2 sides of the triangle are equal, the angles opposite those sides are also equal and vice versa.

Criteria for Congruency of triangles

- The criteria for congruency of triangles are :

- SAS
- ASA
- AAS
- SSS
- RHS

symbolically, it is expressed as $\triangle ABC \cong \triangle XYZ$

Inequalities in Triangles

Relationship between unequal sides of triangle and the angles opposite to it.

- If 2 sides of a triangle are unequal, then the angle opposite to the longer side will be larger than the angle opposite to the shorter side.

Triangle inequality

- The sum of the lengths of any two sides of a triangle must be greater than the third side.

