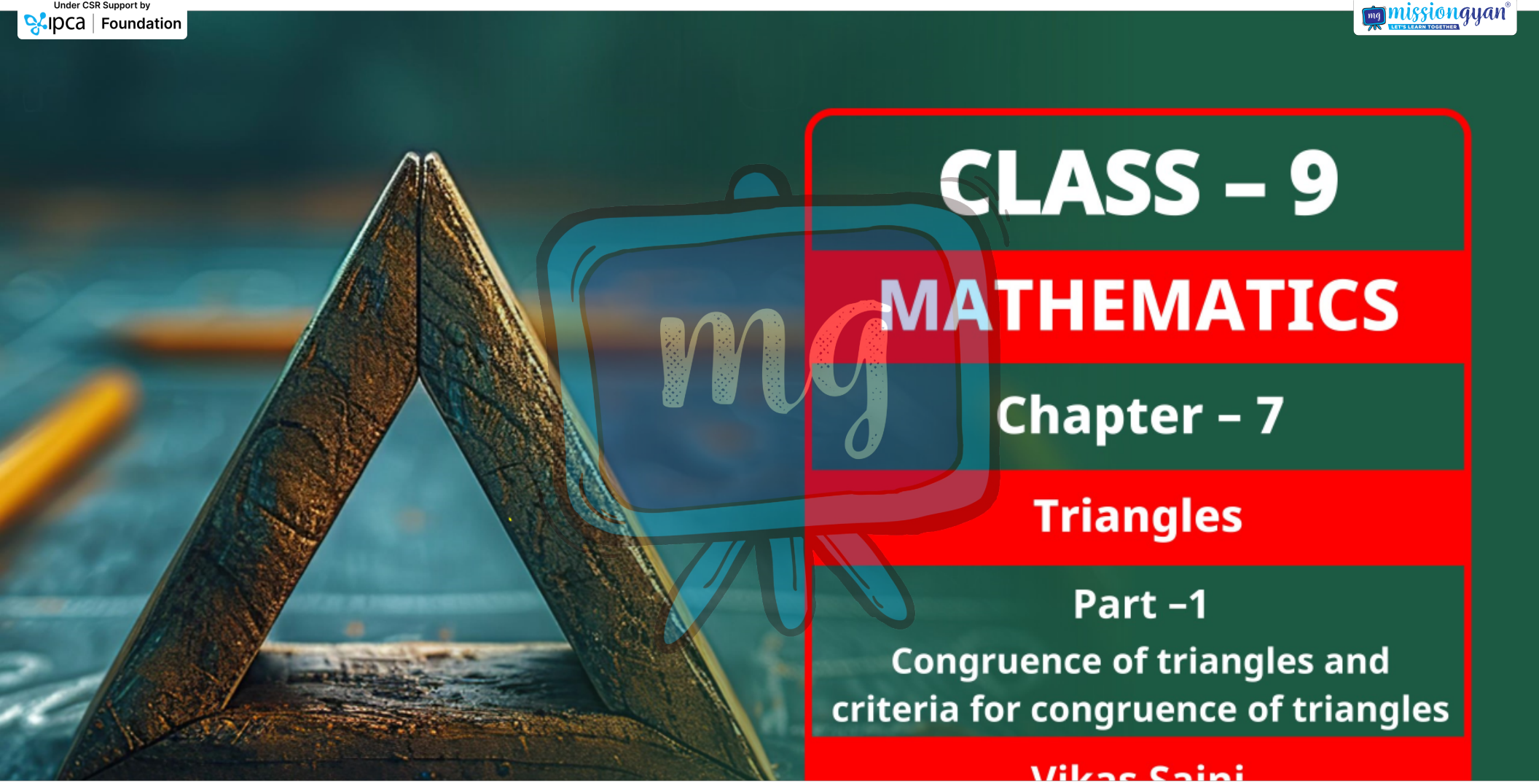
Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER



CLASS – 9

MATHEMATICS

Chapter – 7

Triangles

Part –1

Congruence of triangles and criteria for congruence of triangles

Vikas Saini

Under CSR Support by ipca | Foundation

OVERVIEW

missiongyan LET'S LEARN TOGETHER



1. All-equality of triangles
2. Criteria for congruence of triangles
3. Some properties of a triangle
4. Some more criteria for congruence of triangles

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

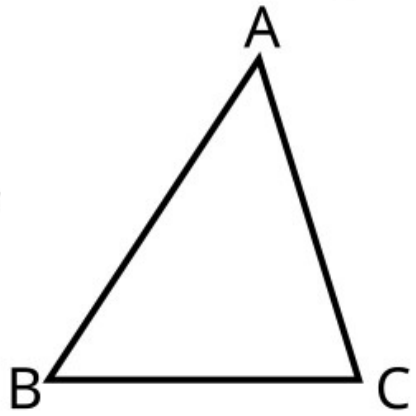
TRIANGLE

A closed figure surrounded by three sides is called a triangle. It has three vertices, three sides and three angles.

Arms : $\overline{AB}$, $\overline{BC}$, $\overline{CA}$

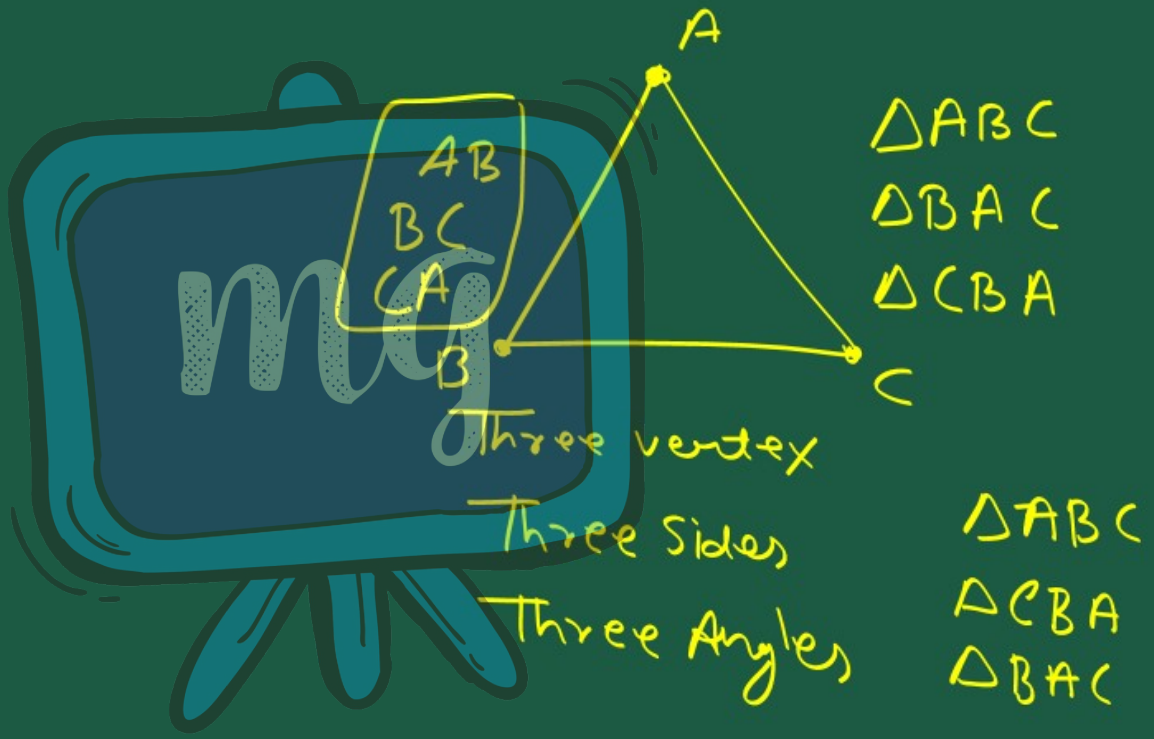
Angle : $\angle BAC$, $\angle ABC$, $\angle BCA$

Vertex : A, B, C



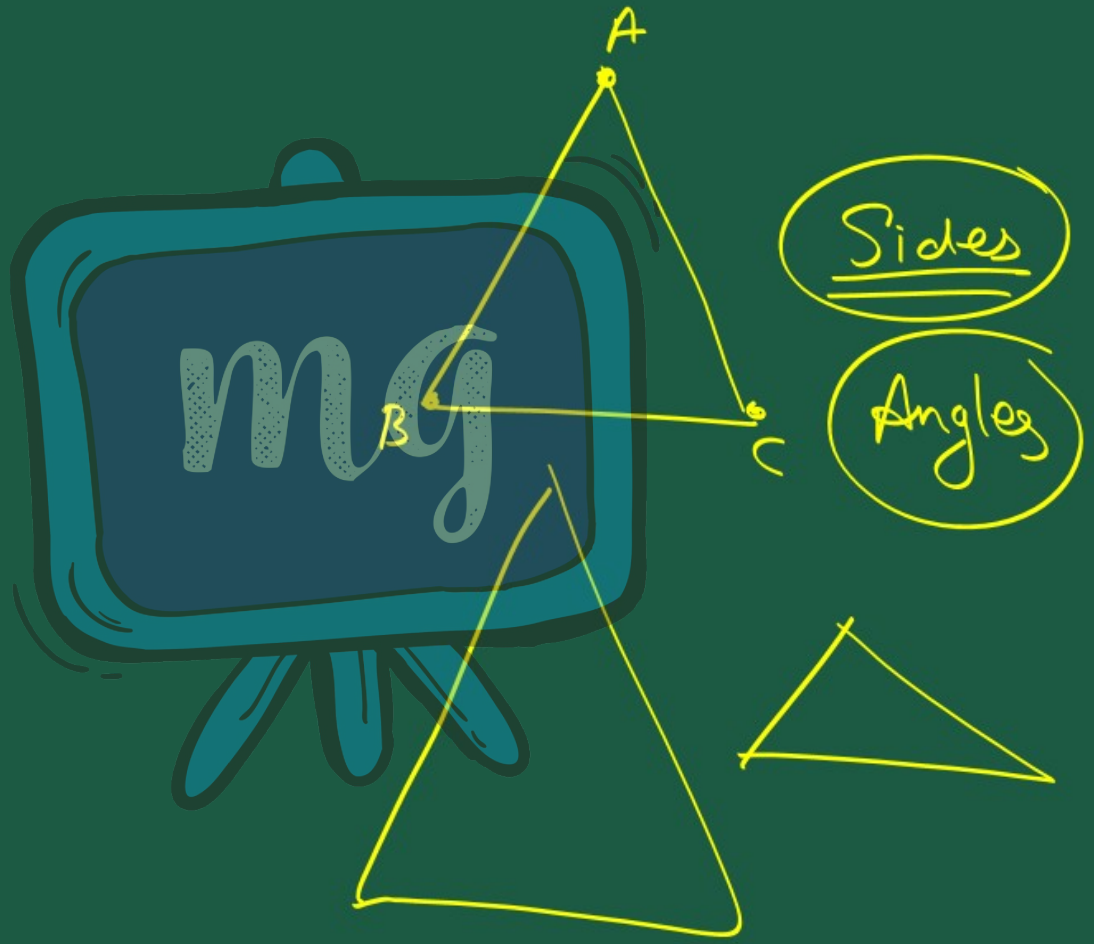
Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER



Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER



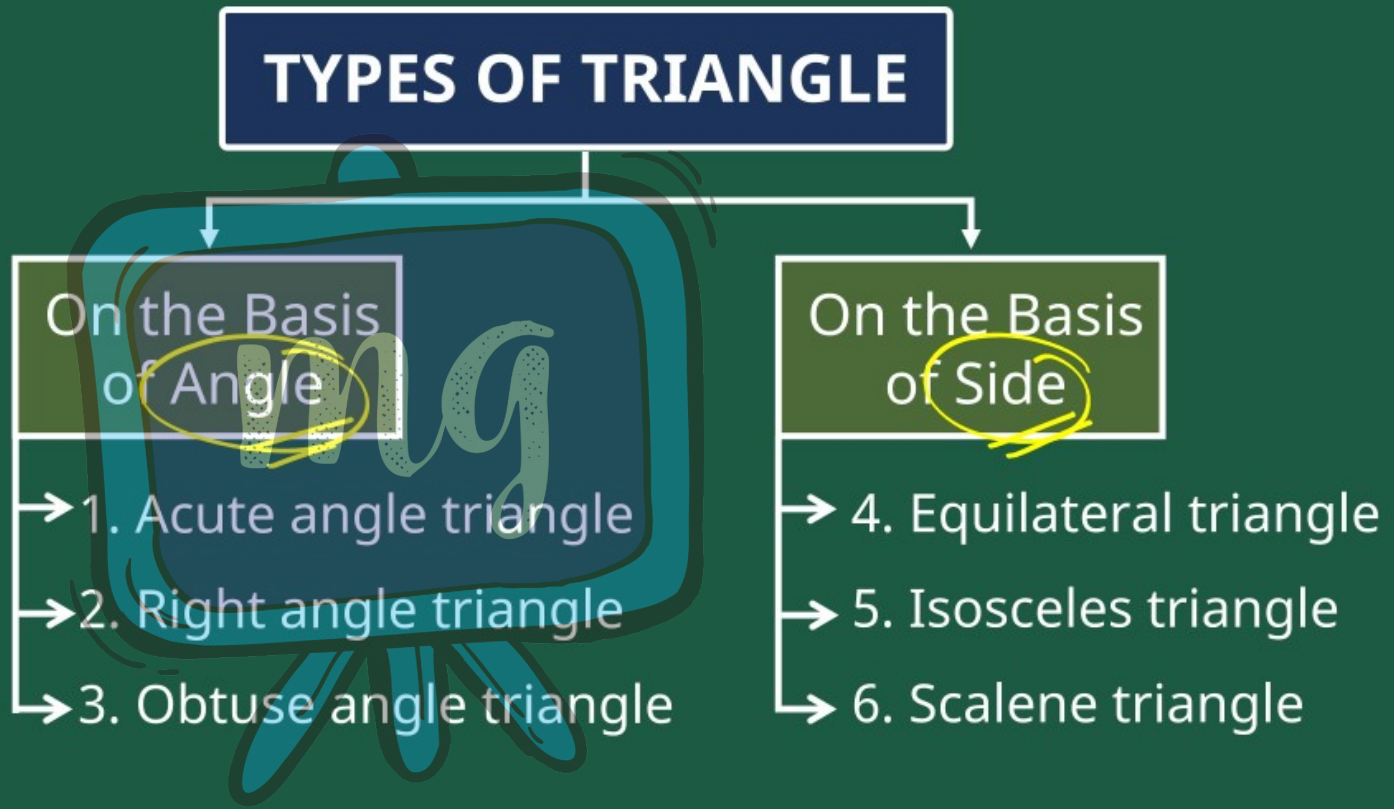
Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER



Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER

TYPES OF TRIANGLE ON THE BASIS OF ANGLE



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

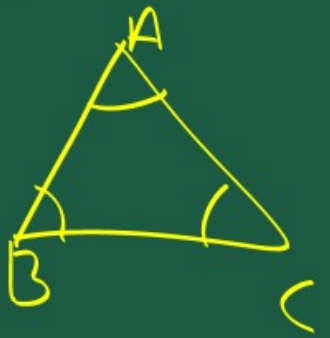
1. ACUTE ANGLE TRIANGLE

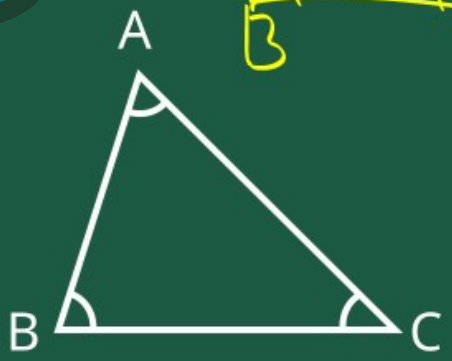
In a triangle if the measure of all angles are acute angles (lesser 90°).

$\angle A < 90°$

$\angle B < 90°$

$\angle C < 90°$





Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

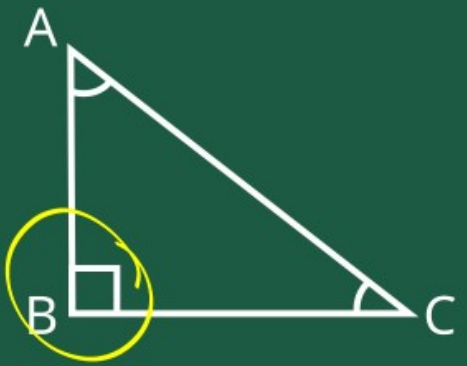
2. RIGHT ANGLE TRIANGLE

A triangle that has one of its interior angles equals to 90° or among the three interior angles if any one is a right angle.

$\angle A < 90°$

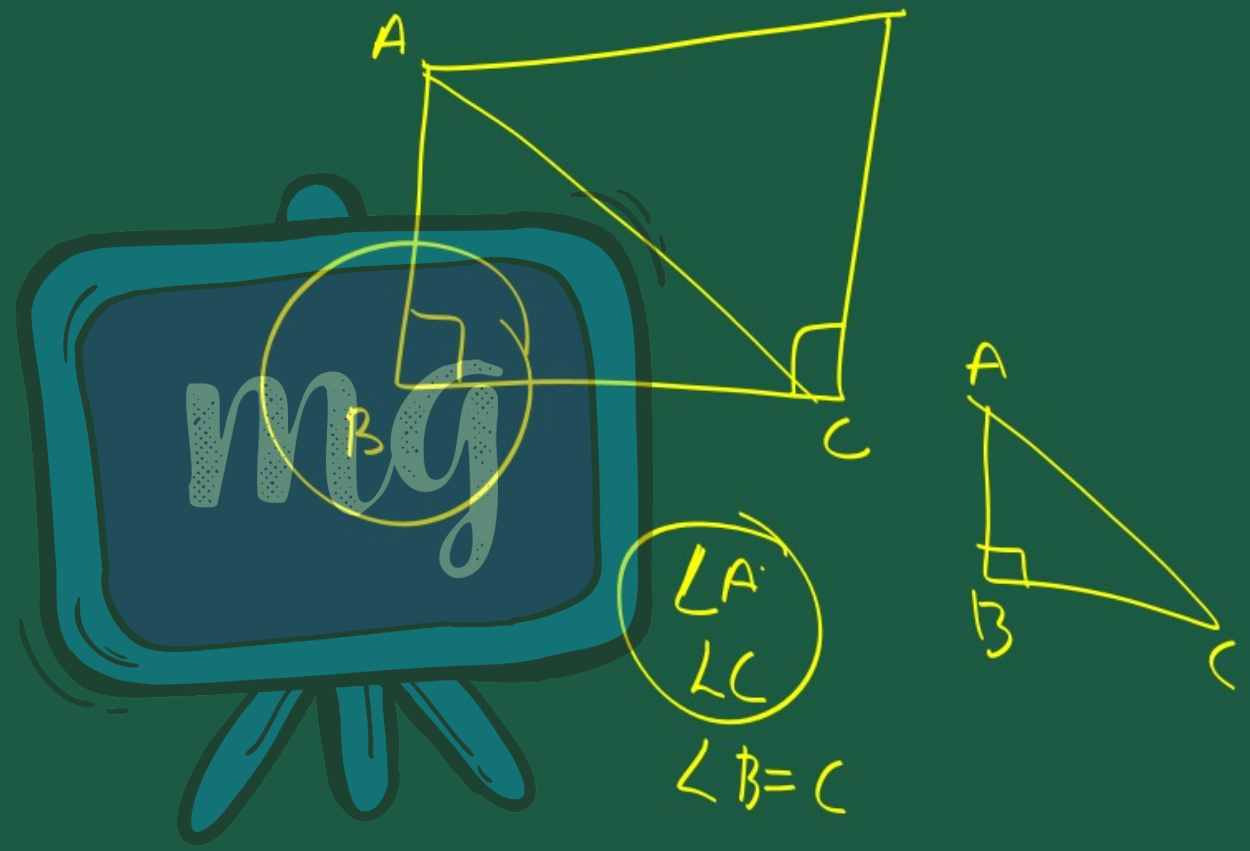
$\angle B = 90°$

$\angle C < 90°$



Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

3. OBTUSE ANGLE TRIANGLE

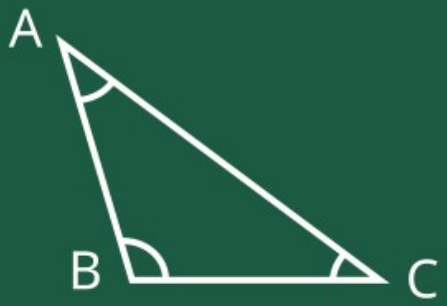
A triangle that has one of its interior angles greater than 90° or among the three interior angles if any one is a obtuse angle.

Obtuse angle

$\angle A < 90°$

$\angle B > 90°$

$\angle C < 90°$



Under CSR Support by ipca | Foundation

missiongyan® LET'S LEARN TOGETHER

TYPES OF TRIANGLE ON THE BASIS OF SIDE



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

1. EQUILATERAL TRIANGLE

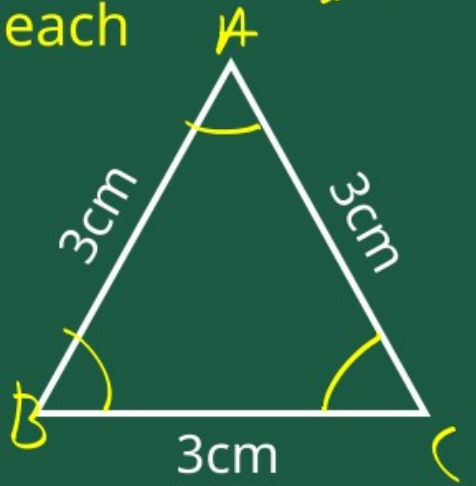
A triangle whose three sides are equal is called an equilateral triangle.

$AB = BC = CA$ (All sides are equal)

$\angle A = \angle B = \angle C = 60°$ each

$\angle A = 60$
$\angle B = 60$
$\angle C = 60$

$AB = 3cm$
$BC = 3cm$
$AC = 3cm$

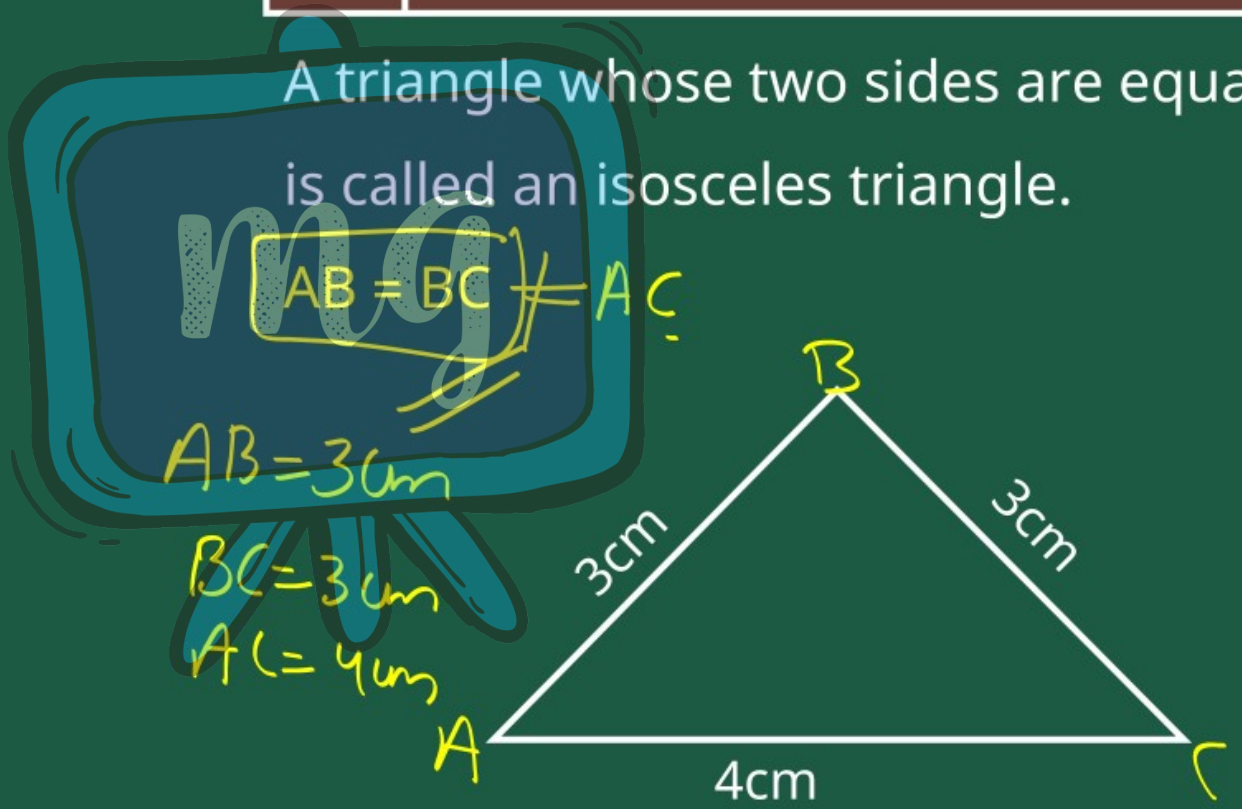


Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

2. ISOSCELES TRIANGLE

A triangle whose two sides are equal is called an isosceles triangle.



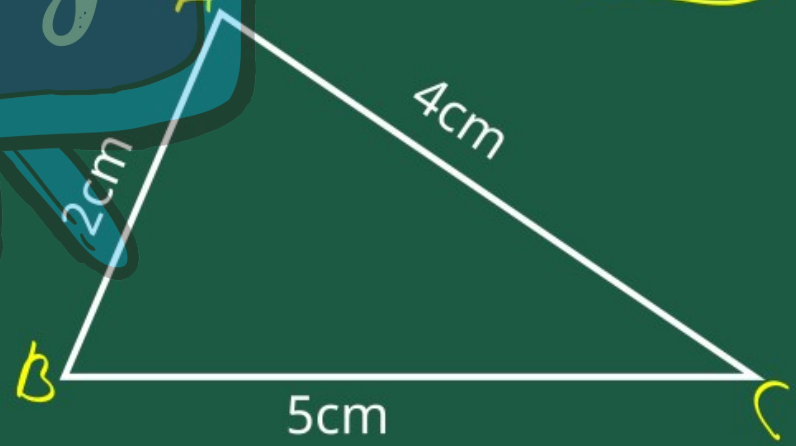
Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

3. SCALENE TRIANGLE

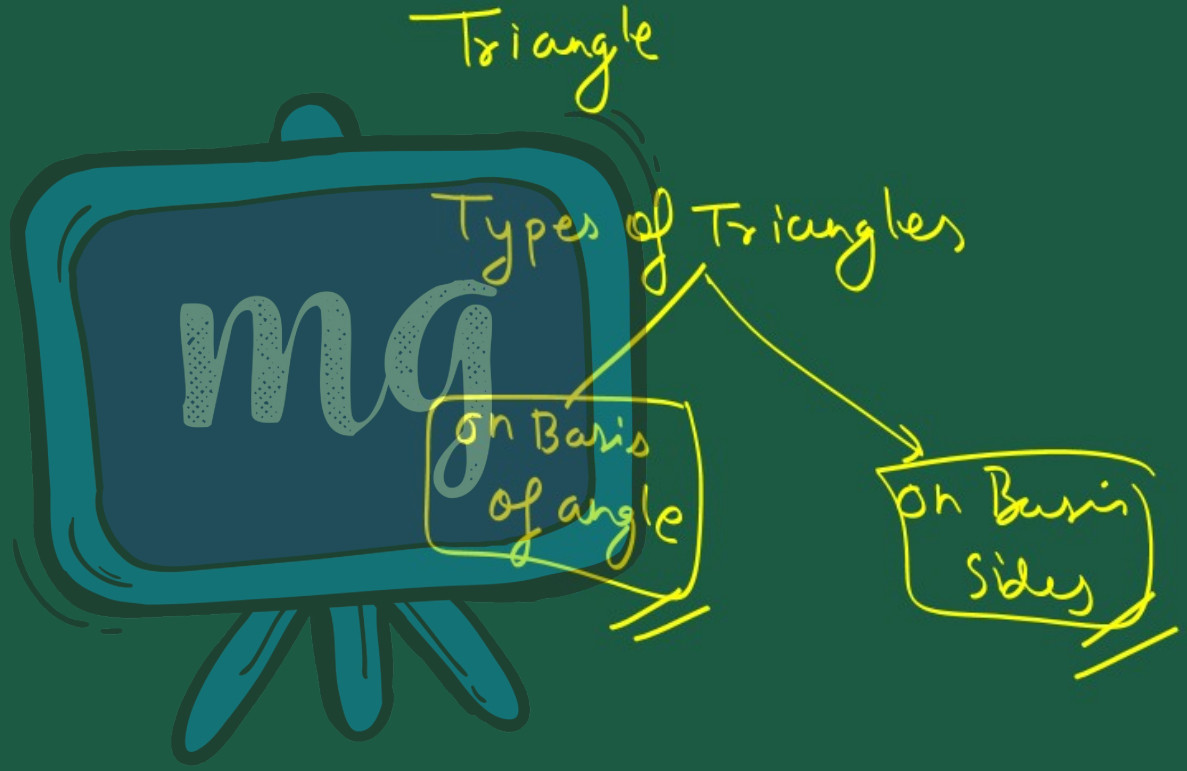
A triangle which does not have any equal sides.

$AB \neq BC \neq CA$ (All sides are unequal)



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

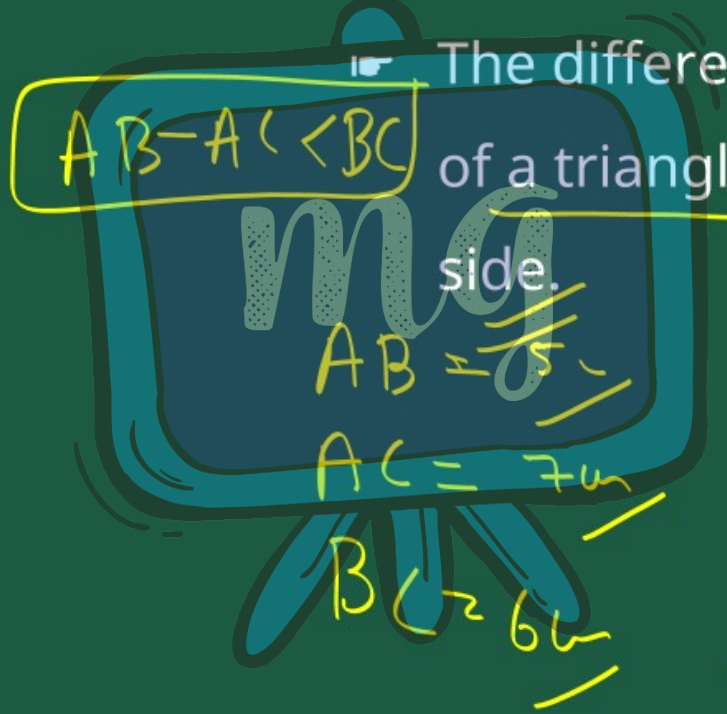


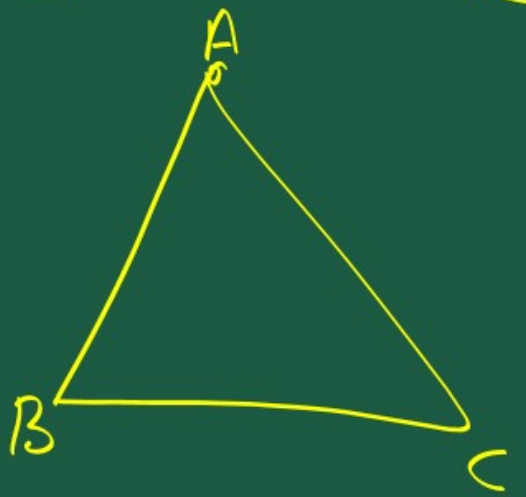
Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

Note

☛ The difference between two sides of a triangle is less than the third side.

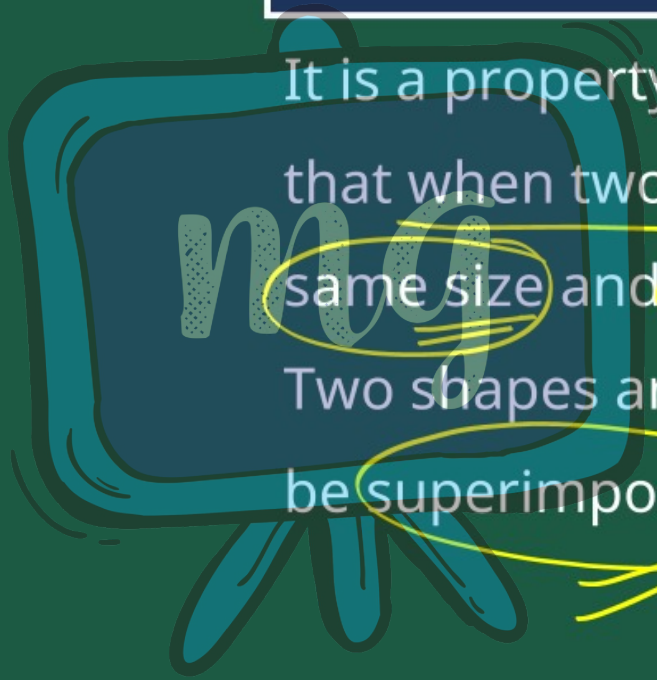




Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

CONGRUENCE

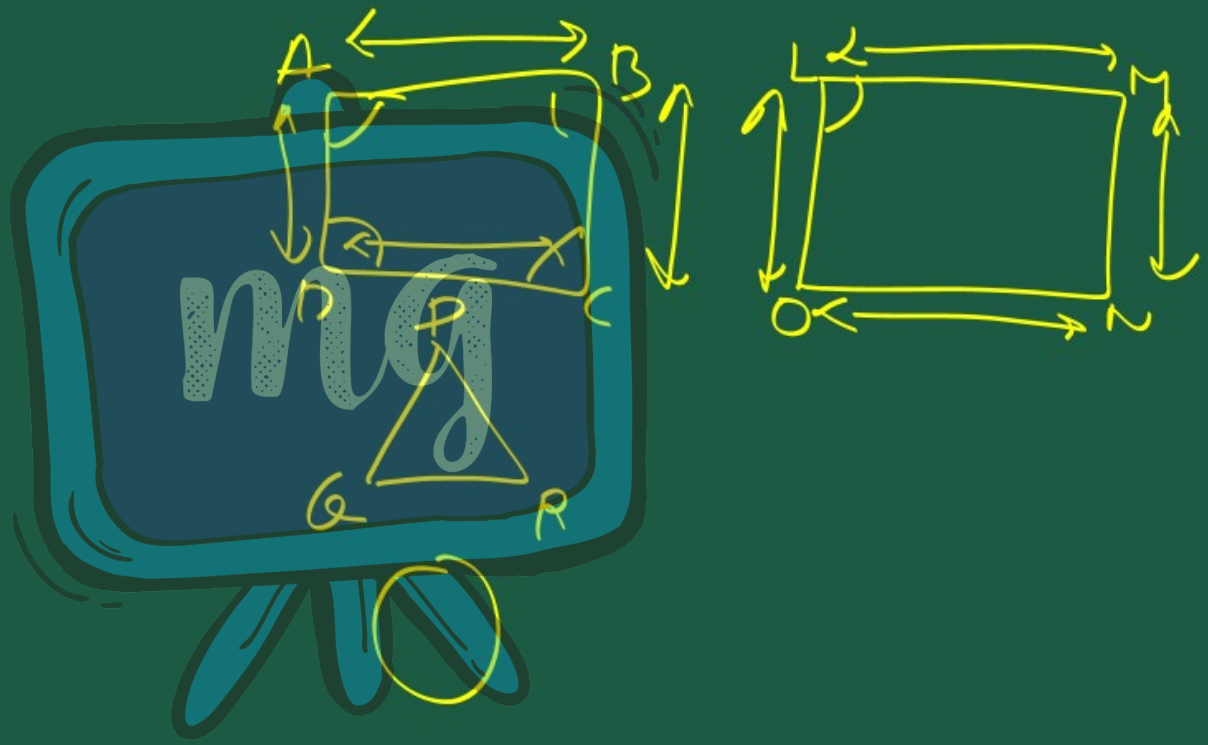


It is a property of shapes that describe that when two or more shapes have same size and same shape.

Two shapes are congruent if the can be superimposed on each other.

Under CSR Support by
ipca | Foundation

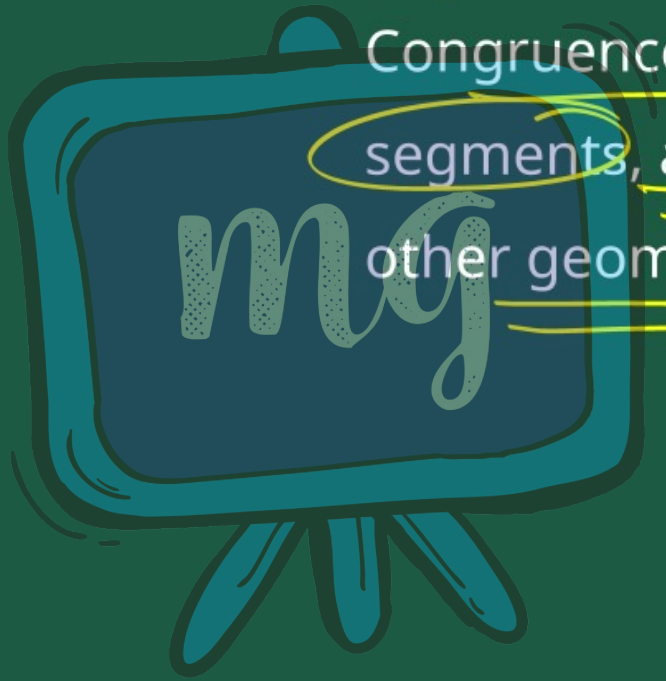
missiongyan®
LET'S LEARN TOGETHER



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

Example :



Congruence shapes can be lines segments, angles, triangle or any other geometric figures.

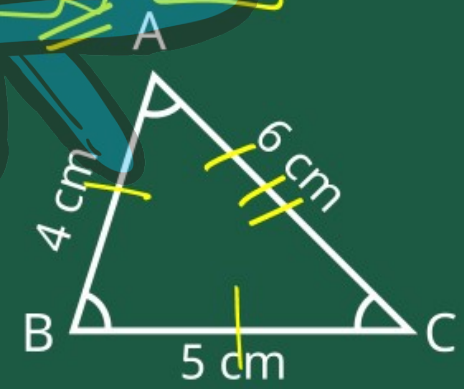
Under CSR Support by ipca | Foundation

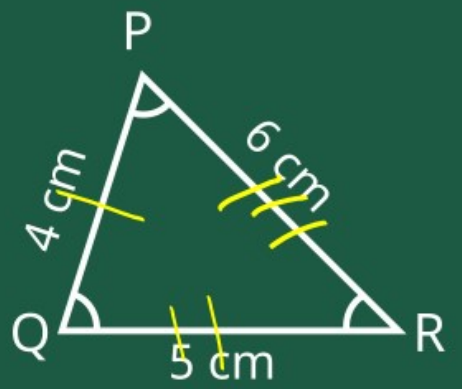
missiongyan LET'S LEARN TOGETHER

CONGRUENCE OF TRIANGLES

If the sides and angles of a triangle are equal to the corresponding sides and angles of another triangle, then those triangles are called congruent.

$\triangle ABC \cong \triangle PQR$

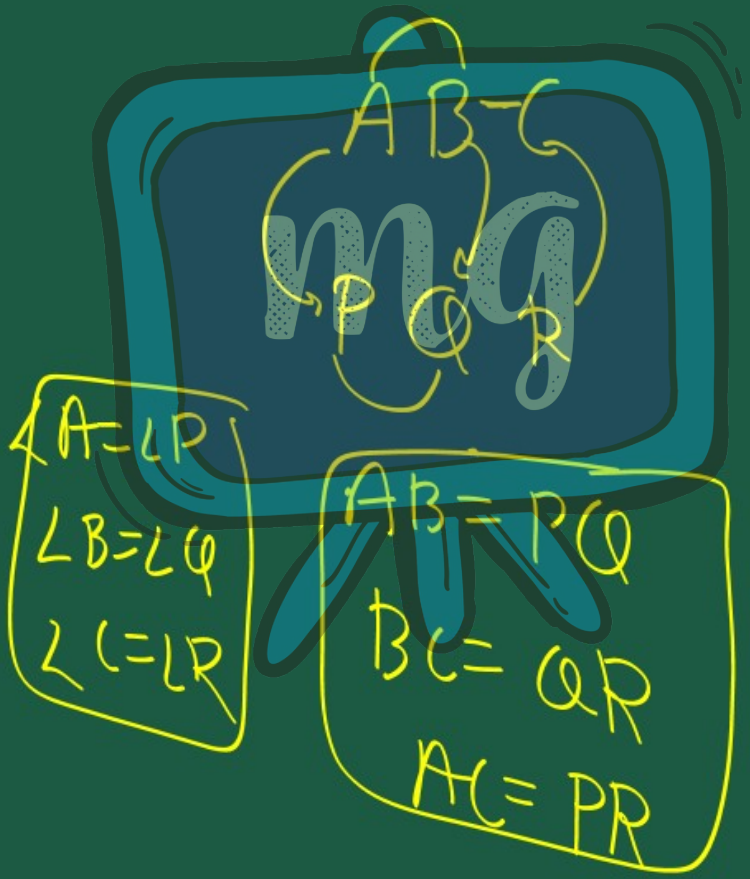


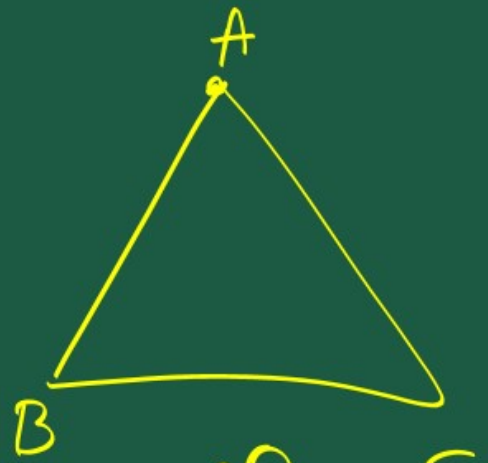


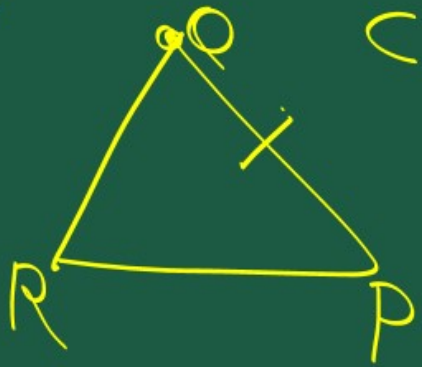
Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

$\triangle ABC \cong \triangle PQR$

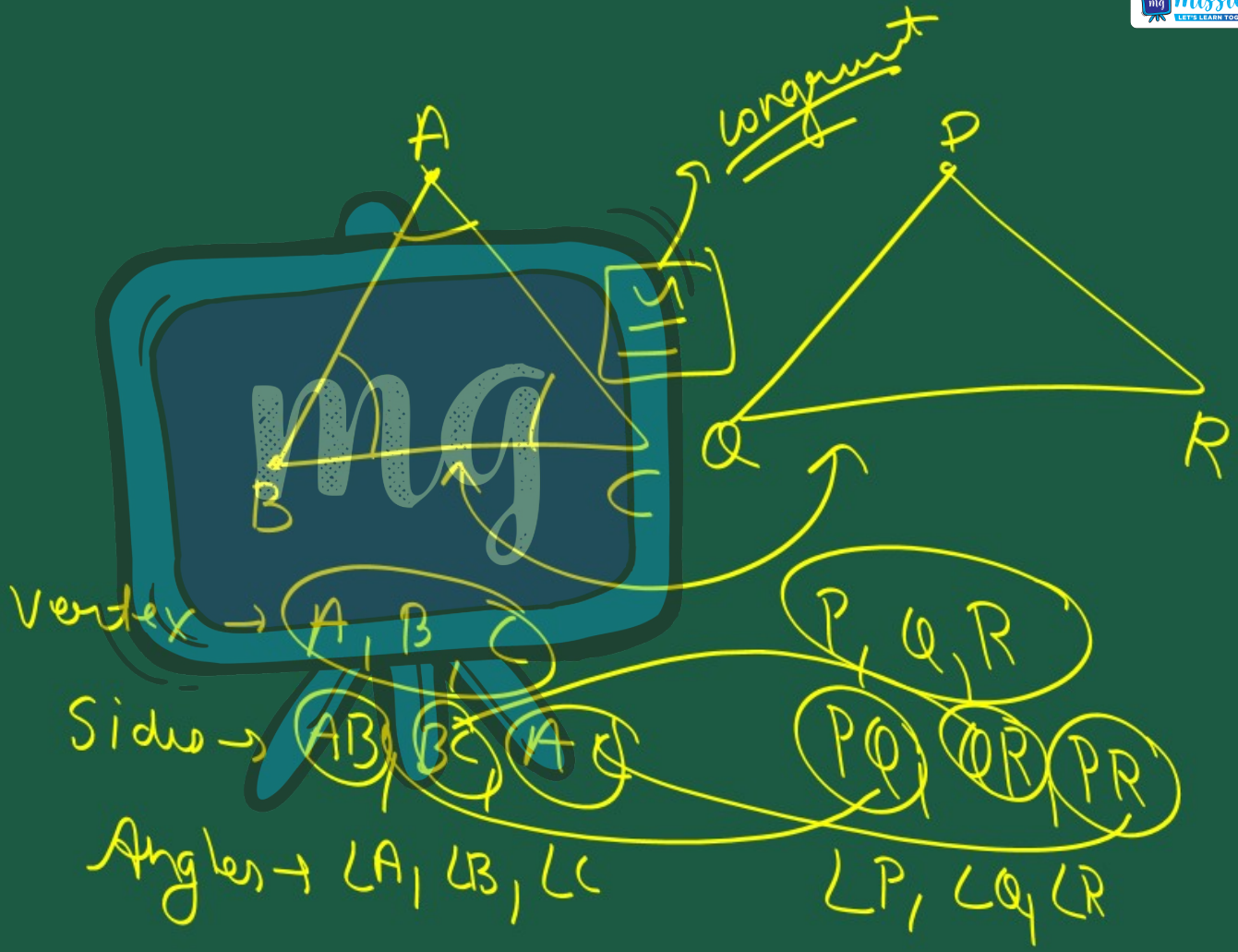






Under CSR Support by ipca | Foundation

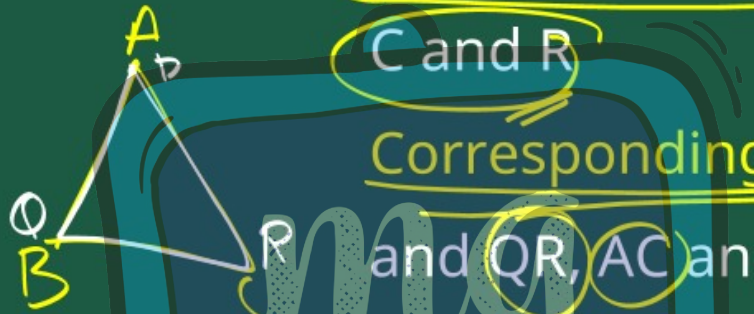
missiongyan LET'S LEARN TOGETHER



Under CSR Support by ipca | Foundation

$\triangle ABC \cong \triangle PQR$

missiongyan LET'S LEARN TOGETHER



Compatible Heads – A and P, B and Q, C and R

Corresponding sides – AB and PQ, BC and QR, AC and PR

Corresponding angles – $\angle A$ and $\angle P$, $\angle B$ and $\angle Q$, $\angle C$ and $\angle R$

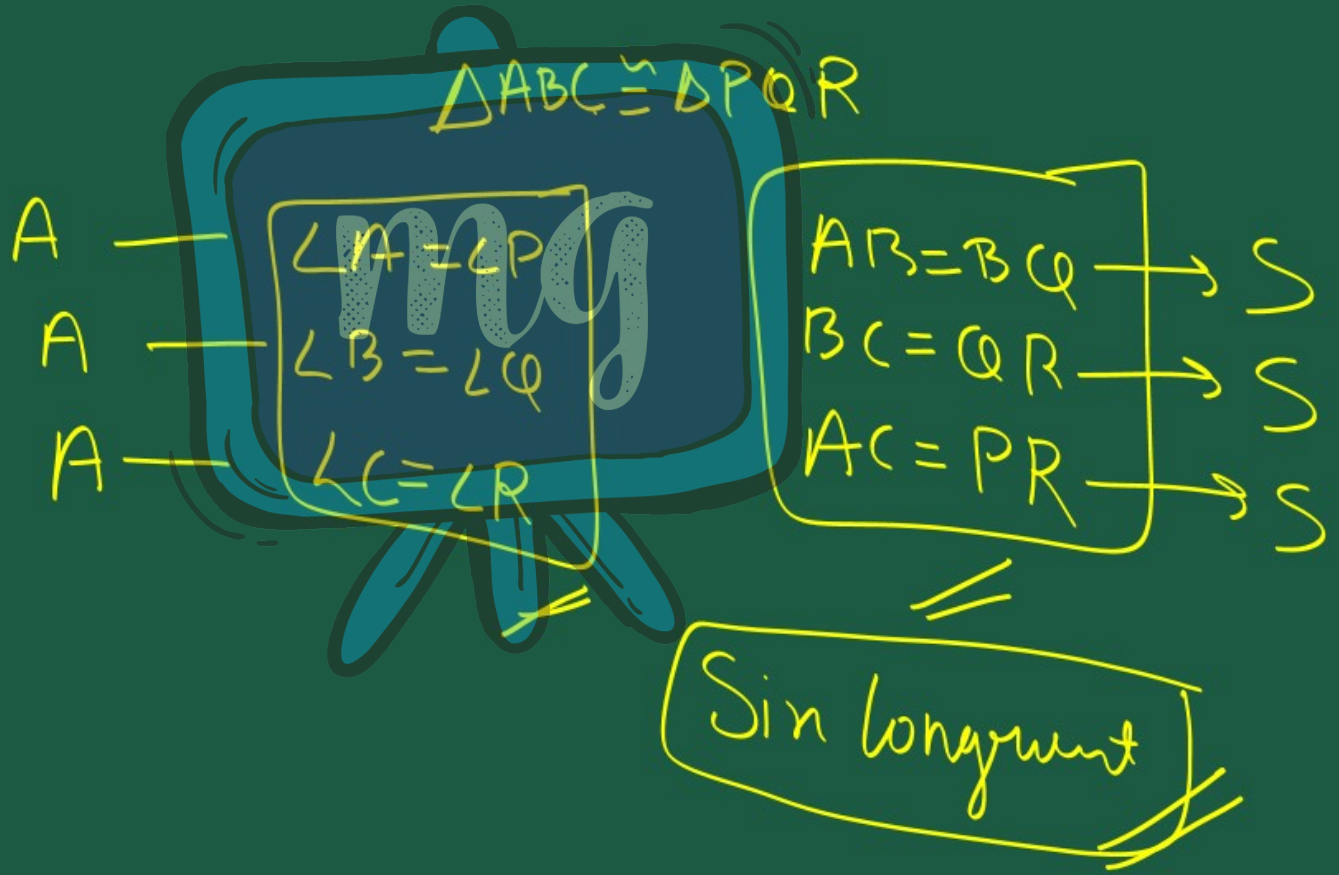
It is written in the following form –

$A \leftrightarrow P$, $B \leftrightarrow Q$, $C \leftrightarrow R$

$AB \leftrightarrow PQ$, $BC \leftrightarrow QR$, $AC \leftrightarrow PR$

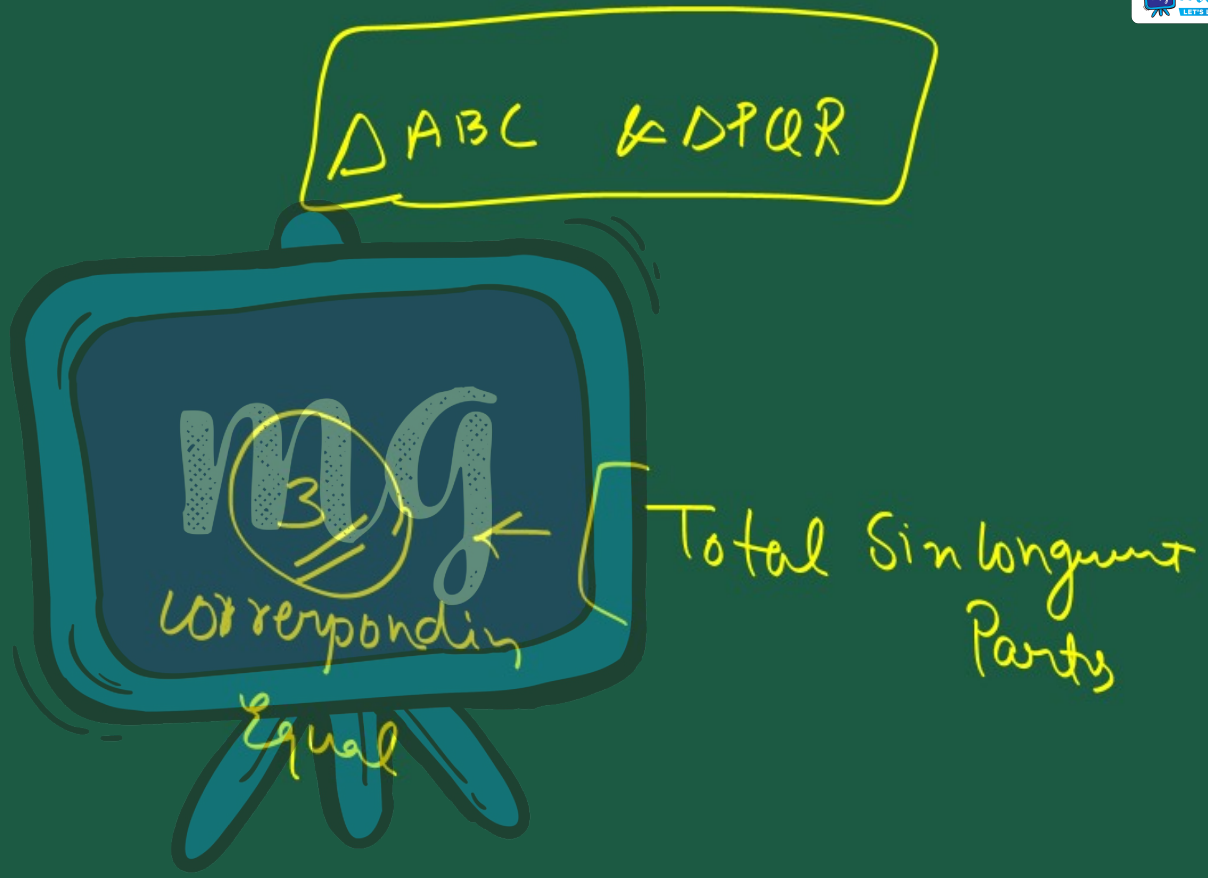
Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER



Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

CRITERIA FOR CONGRUENCE OF TRIANGLES

1.	SAS (Side Angle Side)
2.	ASA (Angle Side Angle)
3.	AAS (Angle Angle Side)
4.	SSS (Side Side Side)
5.	RHS (Right Angle Hypotenuse Side)

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

1. SAS CONGRUENCE RULE

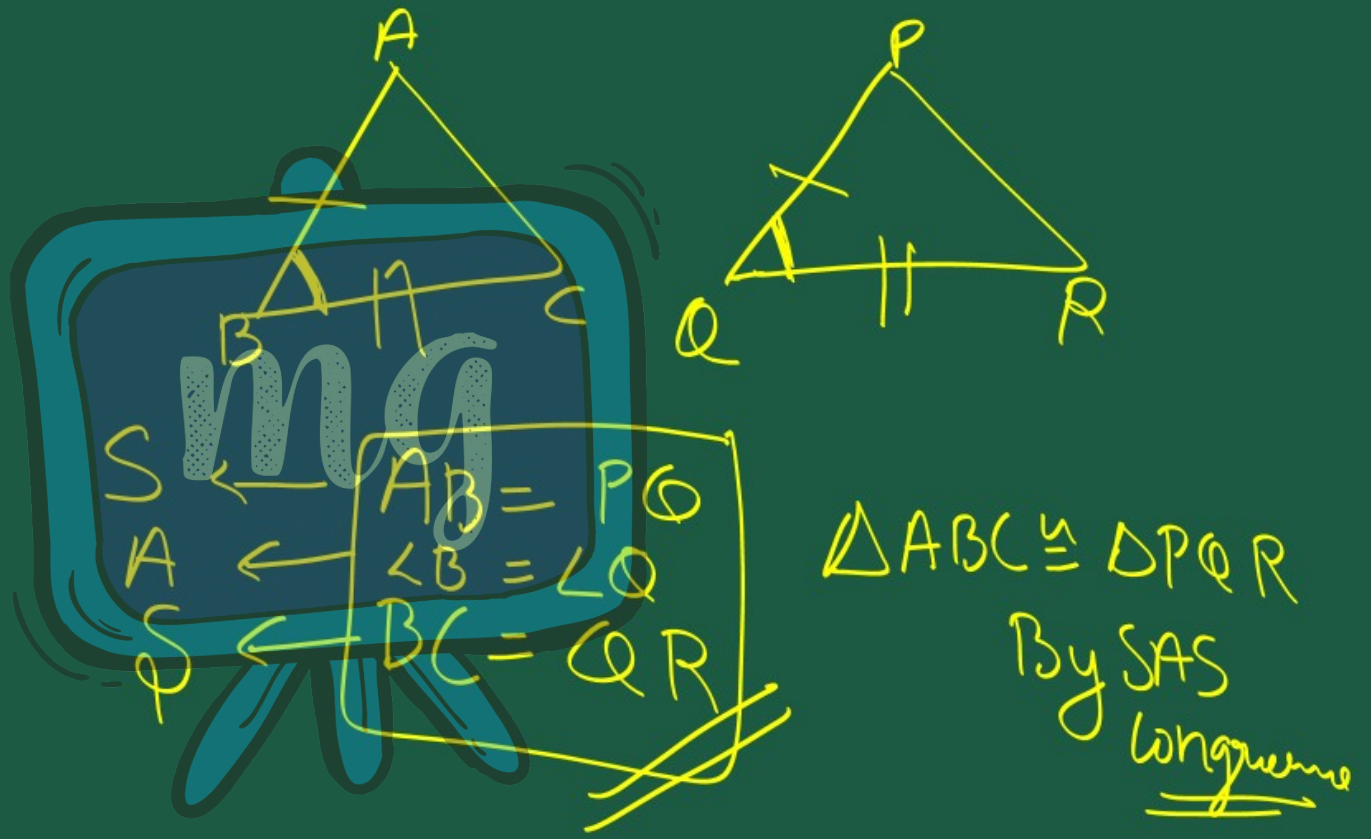
Axiom - 7.1

If two sides and their included angle of a triangle are equal to two sides and their included angle of another triangle, then the two triangles are said to be congruent.

$\triangle ABC \cong \triangle PQR$

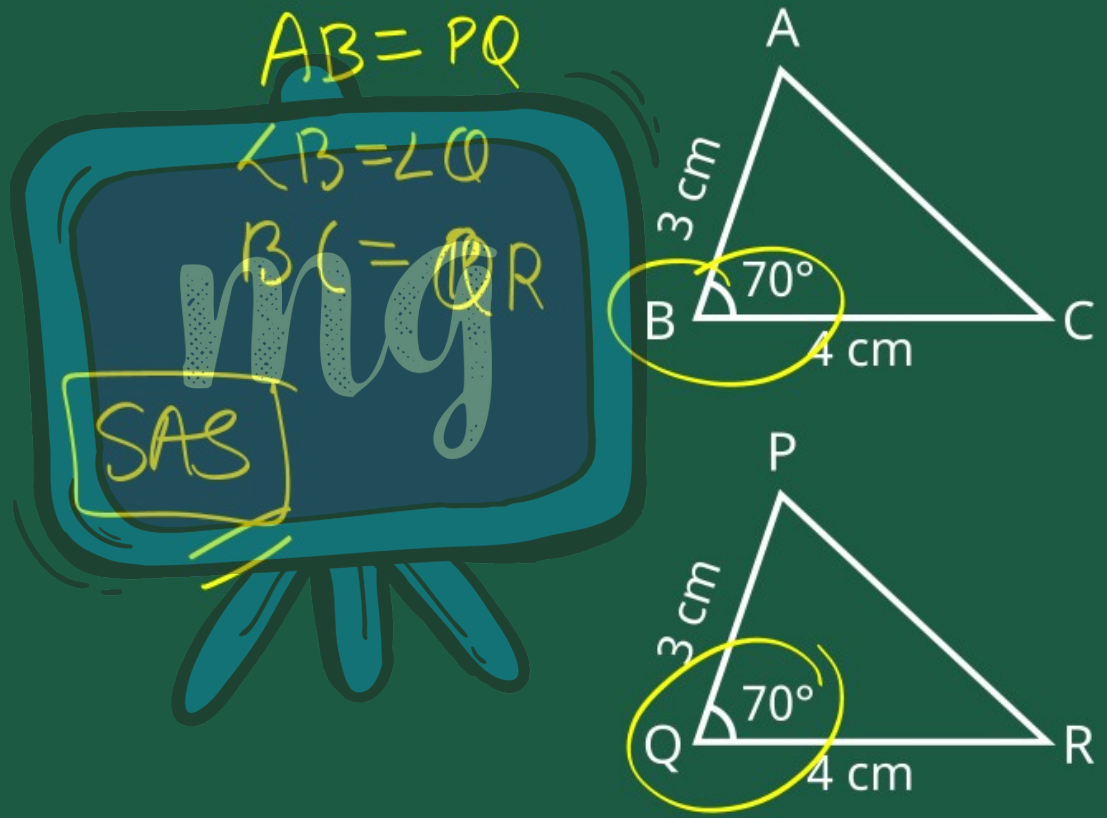
Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER



Under CSR Support by ipca | Foundation

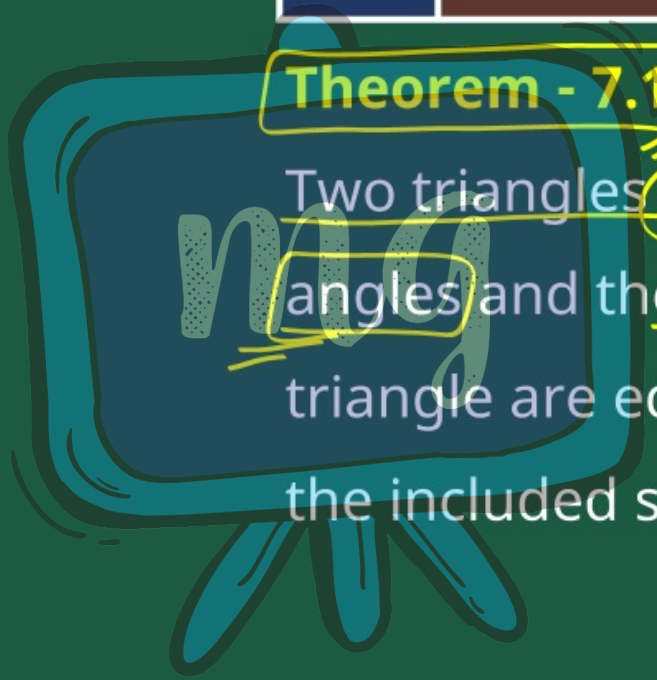
missiongyan LET'S LEARN TOGETHER



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

2. ASA CONGRUENCE RULE

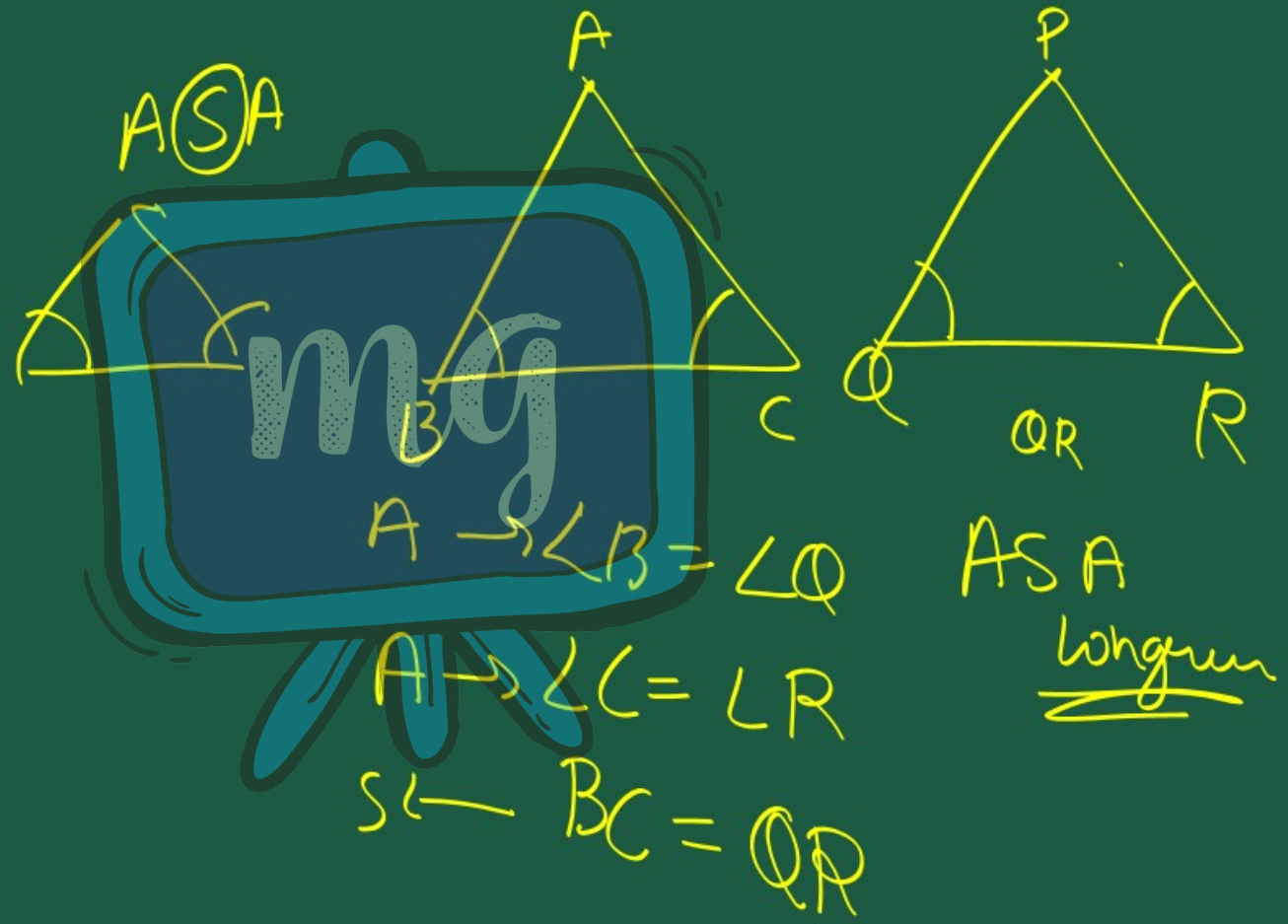


Theorem - 7.1

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.

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

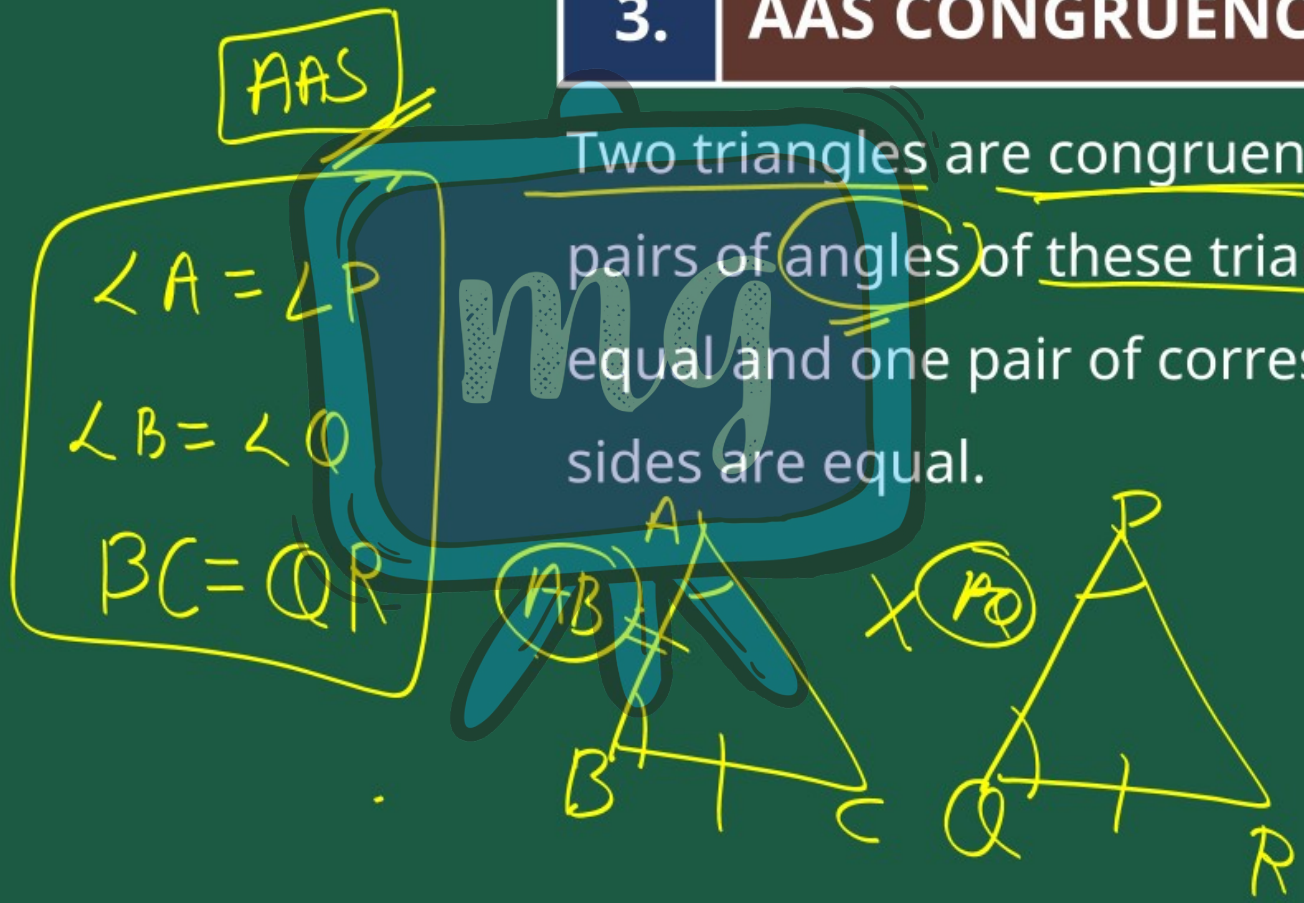


Under CSR Support by ipca | Foundation

missiongyan

3. AAS CONGRUENCE RULE

Two triangles are congruent, if two pairs of angles of these triangles are equal and one pair of corresponding sides are equal.



Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER



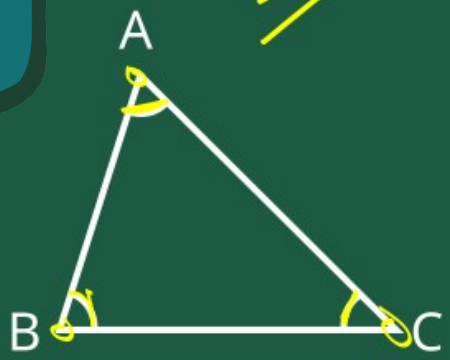
Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER

ANGLE SUM PROPERTY

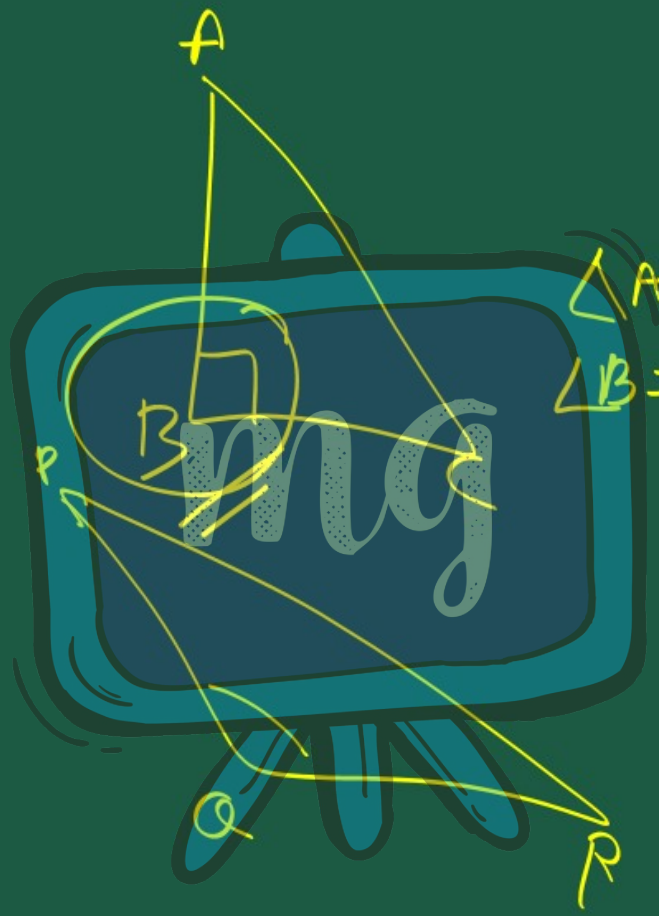
☛ The sum of all three interior angles of a triangle is equal to 180°.

$\angle A + \angle B + \angle C = 180°$



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER



$\triangle ABC$

$\angle B = 90^\circ$

90°

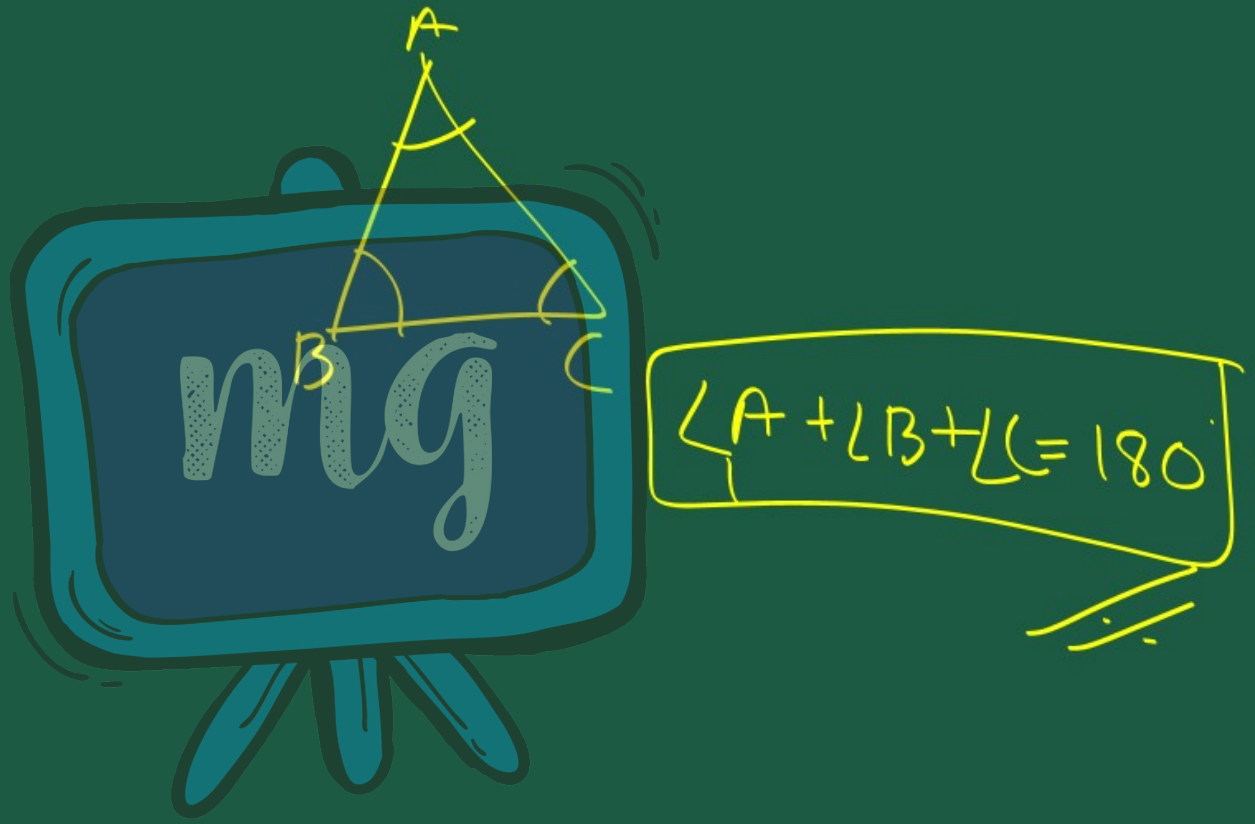
$\angle A + \angle B + \angle C = 180^\circ$

$\angle A + \angle C = 180^\circ - 90^\circ$

$\angle A + \angle C = 90^\circ$

Under CSR Support by
ipca | Foundation

missiongyan
LET'S LEARN TOGETHER



Under CSR Support by ipca | Foundation

LEARNING OUTCOMES

missiongyan LET'S LEARN TOGETHER



1. Triangle
2. Congruence of Triangles
3. Criteria for Congruence of Triangles

Under CSR Support by ipca | Foundation

ASSESSMENT

missiongyan LET'S LEARN TOGETHER



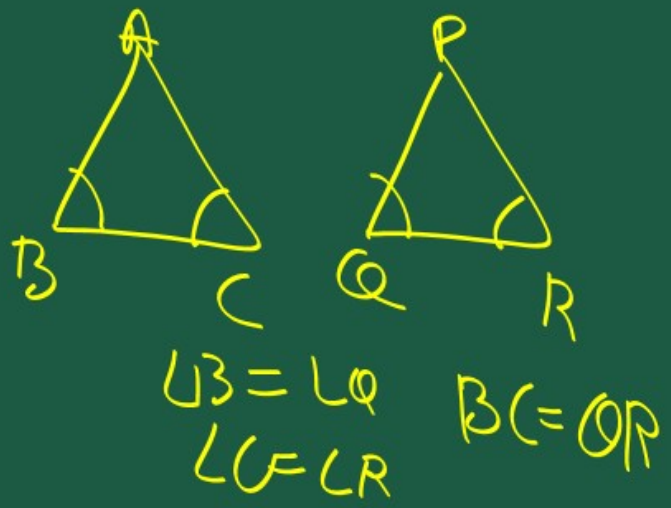
1 For two triangles, if two angles and the included side of one triangle are equal to two angles and the included side of the other triangle. Then the congruence rule is:

A SAS rule

B ASA rule

C AAS rule

D None of these



Under CSR Support by ipca | Foundation

ASSESSMENT

missiongyan LET'S LEARN TOGETHER



2 Which of the following is not a criterion for congruence of triangles?

A SAS

B ASA

C SSS

D SSA

Correct