

MODULE 1/3

CLASS-VII MATHEMATICS

CHAPTER 7

CONGRUENCE OF TRIANGLES

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Introduction

Congruent objects are exact copies of one another.
For example: Two photographs of same object,
two 1 rupee coins.



Here, one stamp covers the other completely and exactly when placed one over the other.

This means that the two stamps are of the same shape and size. In case of coins too, one covers the other exactly.

Definition: Figures having same size and same shape are called congruent figures.

Some more examples of congruent objects are:

1. Shaving blades of same company.
2. Sheets of the same letter pad.
3. Biscuits in the same packet.
4. Toys made of the same mould.

The relation of two objects being congruent is called **CONGRUENCE** and the symbol used for congruence is \cong .

Congruence of plane figures



F1



F2

Consider the two figures given here. Are they congruent?

If we take a trace copy of one of them and place it over the other. If the figures cover each other completely, they are congruent. So we can write $F1 \cong F2$.

1. Two line segments are congruent, if they have the same length.



Therefore, $AB=CD$ implies that $AB \cong CD$.

2. Two angles are said to be congruent, if they have the same measure.

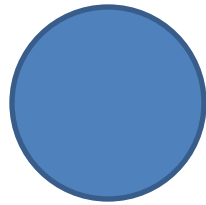


The above two angles are congruent since they have the same measure.

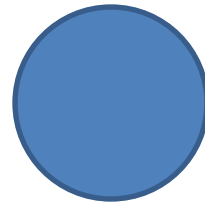
$$\angle ABC = \angle PQR = 45^\circ.$$

Therefore, both the angles are congruent.

3. Two circles are congruent if they have the same radius.



A



B

i.e radius(r_1) of circle A = radius(r_2) of circle B, then
circle A \cong circle B.

Congruence of triangles

Two triangles are congruent if they are copies of each other and when superposed, they cover each other exactly.



Here, $\triangle ABC$ and $\triangle PQR$ have the same size and shape. They are congruent.

So we can express this as $\triangle ABC \cong \triangle PQR$.

If $\triangle ABC$ cover $\triangle PQR$ exactly, we say that there is a matching or correspondence between the vertices of $\triangle ABC$ and $\triangle PQR$.

So we can write A matches with P i.e $A \leftrightarrow P$, $B \leftrightarrow Q$ and $C \leftrightarrow R$. Hence, $AB \leftrightarrow PQ$, $BC \leftrightarrow QR$, $AC \leftrightarrow PR$. Therefore we can write, $ABC \leftrightarrow PQR$.

So $\triangle ABC \cong \triangle PQR$.

Corresponding vertices 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 $\angle R$.

Thank You