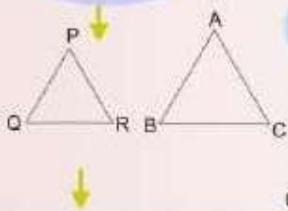


SIMILAR TRIANGLES

Criteria

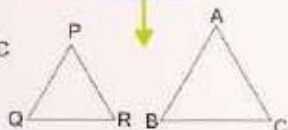


AA criterion :
If $\angle A = \angle P$ and
 $\angle B = \angle Q$ then
 $\triangle ABC \sim \triangle PQR$.

SSS criterion :
If $\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR}$
then
 $\triangle ABC \sim \triangle PQR$

SAS criterion :
If $\frac{AB}{PQ} = \frac{BC}{QR}$ and
 $\angle B = \angle Q$ then
 $\triangle ABC \sim \triangle PQR$

Area theorem

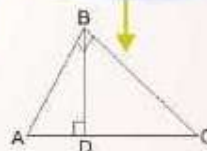


If $\triangle ABC \sim \triangle PQR$:

$$\frac{\text{Area}(\triangle ABC)}{\text{Area}(\triangle PQR)} = \left(\frac{AB}{PQ}\right)^2 = \left(\frac{AC}{PR}\right)^2 = \left(\frac{BC}{QR}\right)^2$$

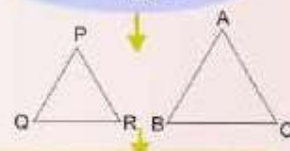
Similarity Means 'Same shape'
e.g. All circles are similar.
All squares are similar.

Pythagoras theorem



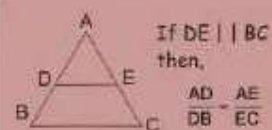
$\triangle ABC$ is right angled $\triangle$ ($\angle B = 90^\circ$)
 $\triangle ABC \sim \triangle BDC \sim \triangle ADB$:
 $BC^2 = CD \times AC$... (i)
 $AB^2 = CA \times AD$... (ii)
Add eq. (i) and (ii)
 $AB^2 + BC^2 = CA \times AD + CD \times AC$
 $AB^2 + BC^2 = AC^2$

If $\triangle$ s are similar Then :



$\frac{AB}{PQ} = \frac{AC}{PR} = \frac{BC}{QR}$ and
 $\angle A = \angle P$
 $\angle B = \angle Q$
 $\angle C = \angle R$

Basic
Proportionality theorem
(THALES THEOREM)



If $DE \parallel BC$
then,
 $\frac{AD}{DB} = \frac{AE}{EC}$

Converse of B.P.T. :

If $\frac{AD}{DB} = \frac{AE}{EC}$ then
 $DE \parallel BC$.

Some Important Results

1. The internal bisector of an angle of a triangle divides the opposite side internally in the ratio of the sides containing the angle.
2. The diagonals of a trapezium divide each other proportionally.
3. Any line parallel to the parallel sides of a trapezium divides the non-parallel sides proportionally.
4. If three or more parallel lines are intersected by two transversals, then the intercepts made by them on the transversals are proportional.
5. In any triangle, the sum of the squares of any two sides is equal to twice the square of half of the third side together with twice the square of the median which bisects the third side.
6. Three times the sum of the squares of the sides of a triangle is equal to four times the sum of the squares of the medians of the triangle.