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Triangle

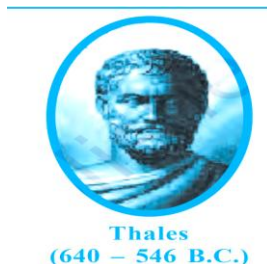
- All congruent figures are similar but the similar figures need not be congruent.
- All those objects which have the same shape but different sizes are called similar objects.

Similarity of Triangles

Two triangles are similar, if

- (i) their corresponding angles are equal
- (ii) their corresponding sides are in the same ratio (or proportion).

If corresponding angles of two triangles are equal, then they are known as **equiangular triangles**.



Thales
(640 – 546 B.C.)

It is believed that he had used a result called the Basic Proportionality Theorem (now known as the Thales Theorem)

Theorem 6.1 If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

OR

Basic Proportionality theorem or Thales Theorem

If a straight line is drawn parallel to one side of a triangle intersecting the other two sides, then it divides the two sides in the same ratio.

We need to prove that $\frac{AD}{DB} = \frac{AE}{EC}$.

Converse of Basic Proportionality Theorem (Converse of Thales Theorem)

If a straight line divides any two sides of a triangle in the same ratio, then the line must be parallel to the third side.

Criteria for similarity of triangles

The following three criteria are sufficient to prove that two triangles are similar.

AAA(Angle-Angle-Angle) similarity criterion

If in two triangles, corresponding angles are equal, then their corresponding sides are in the same ratio (or proportion) and hence the two triangles are similar.

SSS (Side-Side-Side) similarity criterion for Two Triangles In two triangles

if the sides of one triangle are proportional (in the same ratio) to the sides of the other triangle, then their corresponding angles are equal and hence the two triangles are similar.

SAS (Side-Angle-Side) similarity criterion for Two Triangles

If one angle of a triangle is equal to one angle of the other triangle and if the corresponding sides including these angles are proportional, then the two triangles are similar. Areas of Similar Triangles The ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.