

CHAPTER 06

Triangles

Areas of similar triangles:

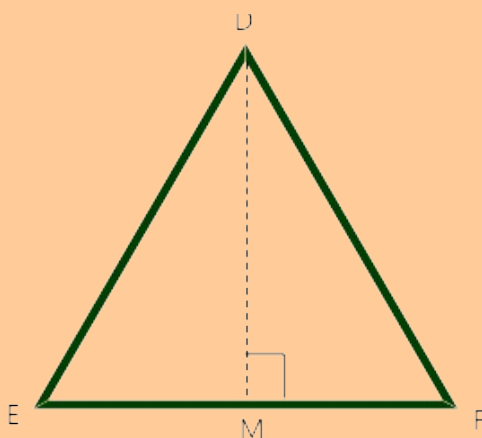
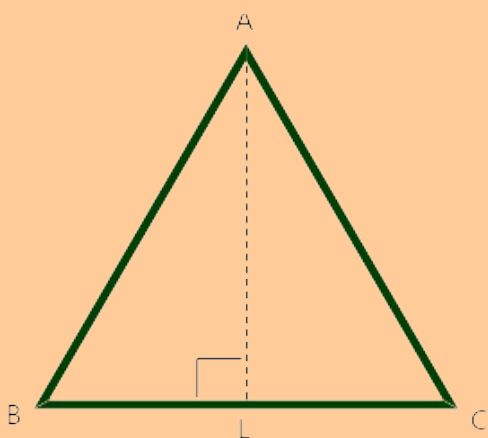
The ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.

i.e.

Two triangles ABC and DEF such that $\triangle ABC \sim \triangle DEF$.

Then,

$$\frac{\text{Area}(\triangle ABC)}{\text{Area}(\triangle DEF)} = \frac{AB^2}{DE^2} = \frac{BC^2}{EF^2} = \frac{AC^2}{DF^2}$$



Note:

- The areas of two similar triangles are in the ratio of the squares of their corresponding altitudes.
- The areas of two similar triangles are in the ratio of the squares of their corresponding medians.
- The areas of two similar triangles are in the ratio of the squares of their corresponding angle bisector segments.

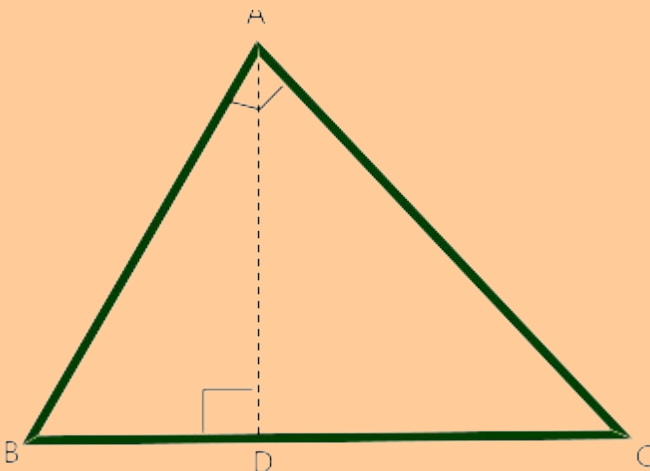
Note:

If a perpendicular is drawn from the vertex of the right angle of a right triangle to the hypotenuse, then triangles on both sides of the perpendicular are similar to the whole triangle and to each other.

i.e. A triangle ABC right angled at A and $AD \perp BC$

Then,

$$\triangle ABD \sim \triangle CAD \sim \triangle CBA$$



Result on similar triangle:

An altitude to the hypotenuse of a right triangle divides the triangle into two triangles that are.

- The altitude is the geometric mean of the projections of the legs onto the hypotenuse of a right triangle.
- A leg of a right triangle is the geometric mean of the hypotenuse and the projection of the leg onto the hypotenuse.

