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(Affiliated to CBSE Up to +2 Level)

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Similarity of triangles

Two triangles are said to be similar if **their corresponding angles are congruent and the corresponding sides are in proportion**.

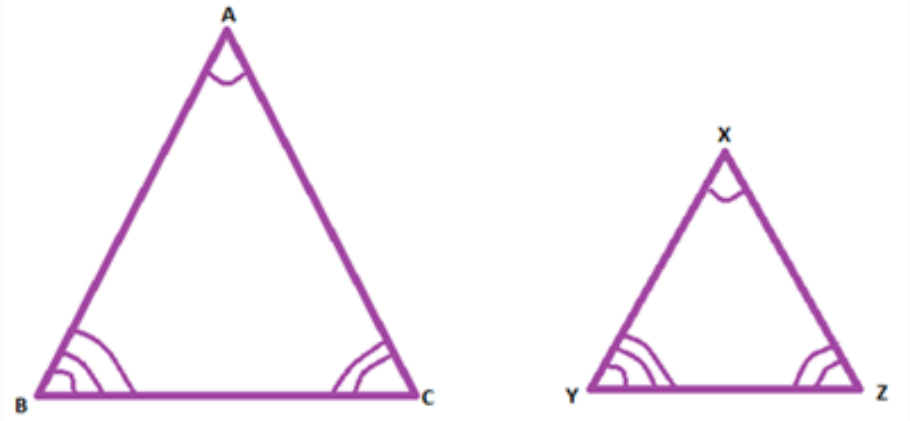
In other words, similar triangles are the same shape, but not necessarily the same size. The triangles are congruent if, in addition to this, their corresponding sides are of equal length.

Triangle is the three-sided polygon. The condition for the similarity of triangles is;

i) Corresponding angles of both the triangles are equal, and

ii) Corresponding sides of both the triangles are in proportion to each other.

Similar Triangle Example



In the given figure, two triangles ΔABC and ΔXYZ are similar only if,

i) ∠A = ∠X, ∠B = ∠Y and ∠C = ∠Z

ii) AB/XY = BC/YZ = AC/XZ (Similar triangles proportions)

Hence, if the above-mentioned conditions are satisfied, then we can say that ΔABC ~ ΔXYZ

It is interesting to know that if the corresponding angles of two triangles are equal, then such triangles are known as equiangular triangles. For two equiangular triangles we can state the Basic Proportionality Theorem (better known as Thales Theorem) as follows:

- For two equiangular triangles, the ratio of any two corresponding sides is always the same.

Properties

- Both have the same shape but sizes may be different
- Each pair of corresponding angles are equal
- The ratio of corresponding sides is the same

Formulas

According to the definition, two triangles are similar if their corresponding angles are congruent and corresponding sides are proportional. Hence, we can find the dimensions of one triangle with the help of another triangle. If ABC and XYZ are two similar triangles, then by the help of below-given formulas, we can find the relevant angles and side lengths.

- $\angle A = \angle X$, $\angle B = \angle Y$ and $\angle C = \angle Z$
- $AB/XY = BC/YZ = AC/XZ$