

## CHAPTER 06

# Triangles

### Criteria for similarity of triangles:

#### Equiangular triangles:

Two triangles are said to be equiangular if their corresponding angles are equal.

#### Angle – Angle – Angle similarity criterion (AAA) :

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.

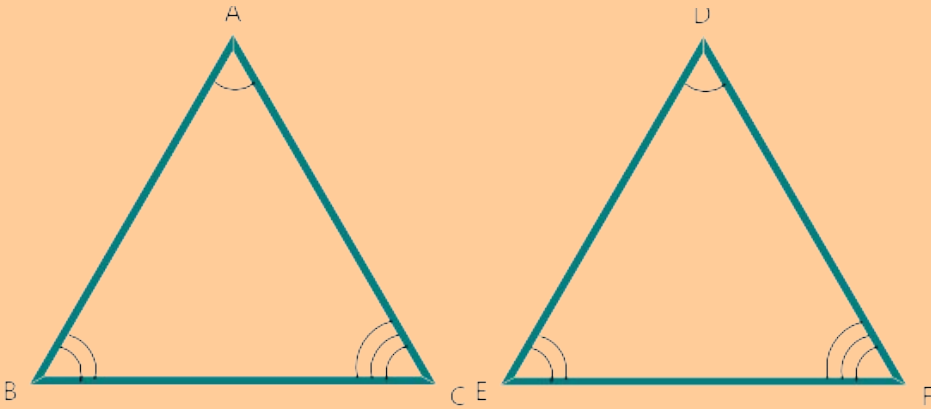
i.e. Two triangles ABC and DEF such that

$$\angle A = \angle D, \angle B = \angle E \text{ and } \angle C = \angle F$$

Then,

$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

$$\therefore \triangle ABC \sim \triangle DEF$$



**Angle – Angle similarity** ( $AA \square$ ):

If two angles of one triangle are respectively equal to two angles of another triangle, then the two triangles are similar.

i.e.

Two triangles  $\triangle ABC$  and  $\triangle DEF$

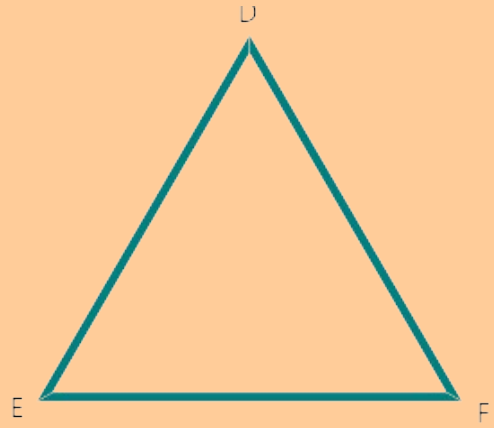
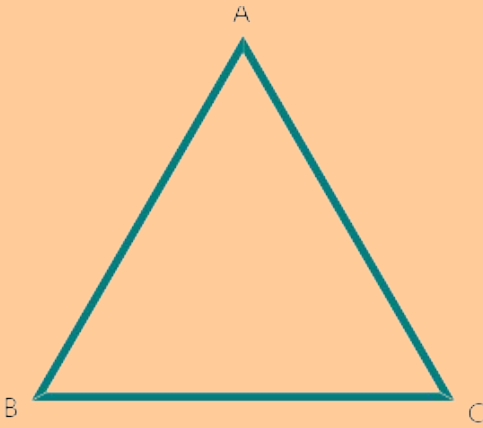
Such that,

$$\angle A = \angle D \text{ and } \angle B = \angle E$$

Then,

$$\angle C = \angle F$$

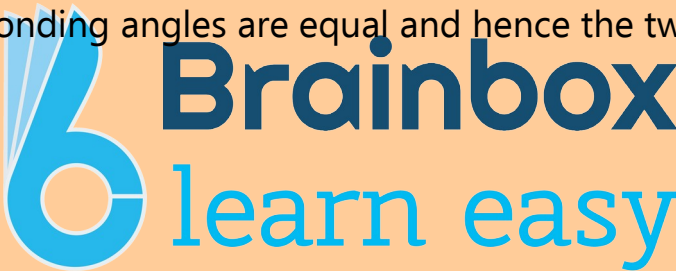
Thus, two triangles are equiangular and hence they are similar.



### Side – Side – Side similarity (SSS) criterion:

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

**Note:**



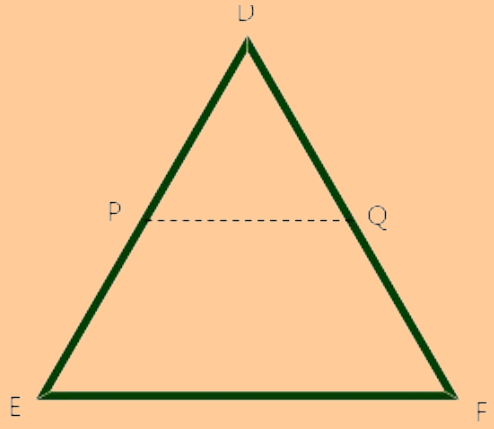
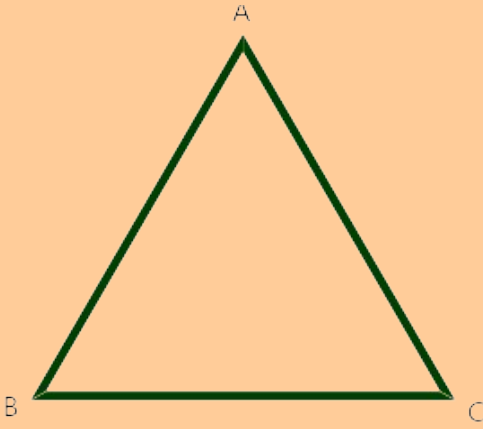
In case of similarity of two triangles, it is not necessary to check both the conditions (AAA and SSS), because one condition implies the other.

### Side – Angle – Side similarity (SAS) criterion:

If one angle of a triangle is equal to one angle of the other triangle and the sides including these angles are proportional, then the two triangles are similar.

i.e.

Two triangles ABC and DEF such that  $\angle A = \angle D$  and  $\frac{AB}{DE} = \frac{AC}{DF}$

**Note:**

If two triangles are similar, then their corresponding sides are proportional and they are proportional to the corresponding perimeters of the triangles.

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