# SIMILAR TRIANGLES

## Similar Triangles

Triangles are said to be similar if they have the following properties...

Property 1

Corresponding pairs of angles are equal

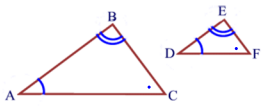
Property 2

Corresponding pairs of sides are proportional

**There are three accepted methods of proving triangles similar:**

**AA** If two angles of one triangle are equal to two angles of another triangle the triangles are similar.

**Theorem:** If two angles of one triangle are congruent to two angles of another triangle, the triangles are similar.



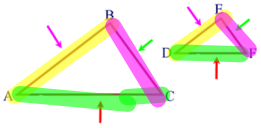

If: $\measuredangle A \cong \measuredangle D$

$\measuredangle B \cong \measuredangle E$

Then: $\Delta ABC \sim \Delta DEF$

**SSS** for similarity — The three side in the two triangles are in proportion.

**Theorem:** If the three sets of corresponding sides of two triangles are in proportion, the triangles are similar.

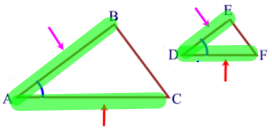



If: $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$

Then: $\Delta ABC \sim \Delta DEF$

**SAS** for similarity — Two sides in each triangle are proportionate and the angle between the two sides are equal in each triangle.

**Theorem:** If an angle of one triangle is congruent to the corresponding angle of another triangle and the lengths of the sides including these angles are in proportion, the triangles are similar.




If: $\measuredangle A \cong \measuredangle D$

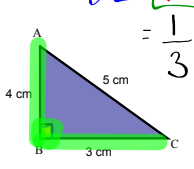
$\frac{AB}{DE} = \frac{AC}{DF}$

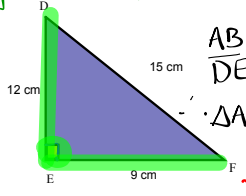
Then: $\Delta ABC \sim \Delta DEF$

Prove Similarity

$\frac{AB}{DE} = \frac{4}{12} \quad \frac{BC}{EF} = \frac{3}{9} = \frac{1}{3}$

$= \frac{1}{3}$



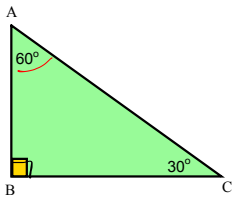

$\frac{AB}{DE} \simeq \frac{BC}{EF}$

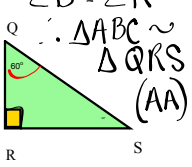
$\therefore \Delta ABC \sim \Delta DEF$

(SAS)

## Prove Similarity

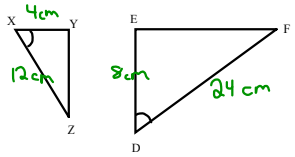
a)



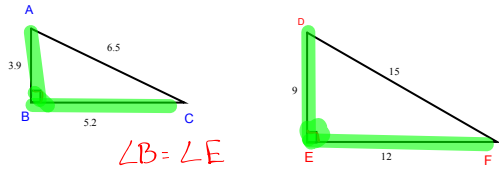




$\angle A = \angle Q$
$\angle B = \angle R$
$\therefore \Delta ABC \sim \Delta QRS$ (AA)

b)




c)




$\angle B = \angle E$

$\frac{AB}{DE} \sim \frac{BC}{EF}$

$\frac{3.9}{9} \quad \frac{5.2}{12}$

$0.4\overline{3} \sim 0.4\overline{3}$ (SAS)

$\triangle ABC \sim \triangle DEF$ (SAS)

## Remember

Triangles are said to be similar if they have the following properties...

**Property 1**

Corresponding pairs of angles are equal — AA

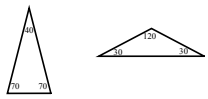
**Property 2**

Corresponding pairs of sides are proportional — SAS, SSS

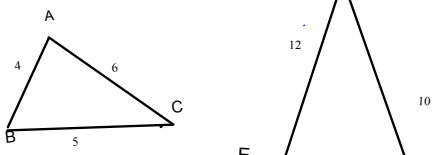
Are the triangles similar? Why or Why not?

a)


b)




d)




$\frac{AC}{DE} = \frac{6}{12} = \frac{1}{2}$

$\frac{AB}{EF} = \frac{4}{8} = \frac{1}{2}$

$\frac{BC}{DF} = \frac{5}{10} = \frac{1}{2}$

$\Delta CAB \sim \Delta DEF$

$\frac{25}{x} = \frac{47}{86}$

$\frac{25(86)}{47} = \frac{47x}{47}$

$x = 45.7$

$x \cdot \frac{25}{x} = \frac{47}{86} \cdot x$

$86 \cdot 25 = \frac{47x}{86} \cdot 86$

$\frac{2150}{47} = \frac{47x}{47}$

$x = \frac{2150}{47}$

$= 45.7$

Proportions – Do 6 questions

Similar $\Delta$s → 1. a, c, e, f

## Attachments

Similar Triangles.docx