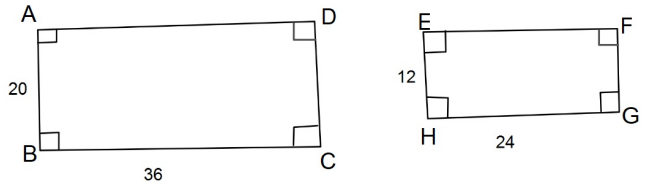
To show that two polygons are similar you must show that:

- All pairs of corresponding angles are ≅. and
- All pairs of corresponding sides have the same ratio.

Are this pair of polygons similar?



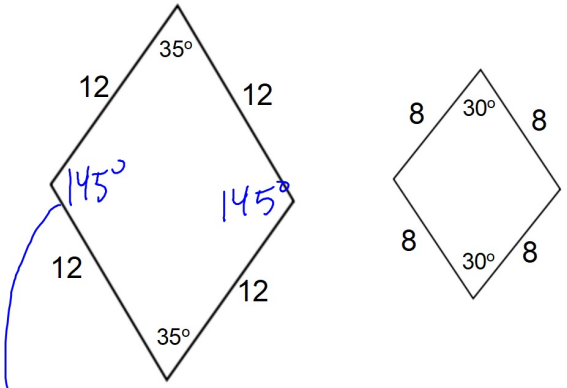
Are all pairs of corresponding angles congruent?

Yes, all angles are 90°

Do all pairs of corresponding sides have the same ratio?

No. $\frac{20}{12} \neq \frac{36}{24}$

Is this pair of polygons similar?



Do all pairs of corresponding sides have the same ratio?

$\frac{12}{8} = \frac{12}{8} = \frac{12}{8}$ Yes

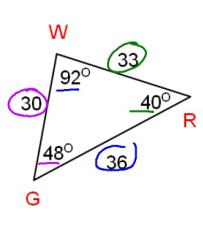
Are all pairs of corresponding angles congruent?

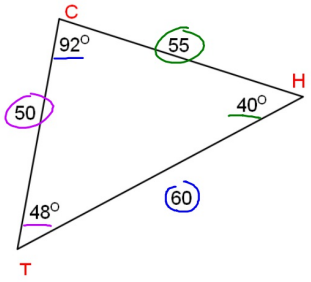
No corresponding angles are ≅

These angles are found by doing the following:
(360-35-35)÷2

Therefore, these figures are not similar because even though all pairs of corresponing sides have the same ratio, corresponding angles are not congruent.

Are these triangles similar?





Are corresponding angles congruent? Yes

Are corresponding sides proportional? Yes

$\frac{30}{50} \stackrel{?}{=} \frac{36}{60} \stackrel{?}{=} \frac{33}{55}$

$\frac{3}{5} = \frac{3}{5} = \frac{3}{5}$

Therefore, the triangles are similar because all corresponding angles are ≅ and all pairs of corresponding sides have the same ratio.

Hwk #11 Sec 7-2

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Problems 2-5, 7, 8, 10, 11, 13, 14

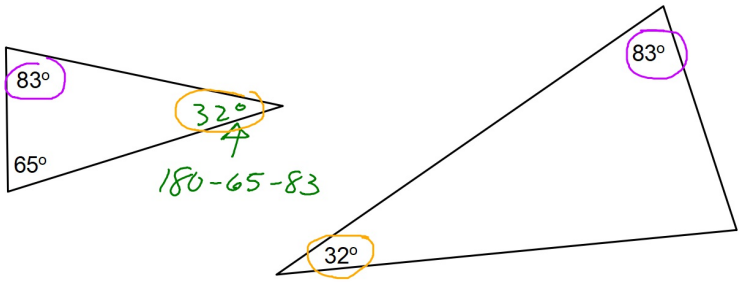
Sec 7-3: Proving Triangles are Similar

To show that two polygons are similar you must show that:

- All pairs of corresponding angles are ≅. and
- All pairs of corresponding sides have the same ratio.

UNLESS THE FIGURES ARE TRIANGLES.

Are these triangles similar?



For triangles, to show that they are similar it's good enough to show that two pairs of corresponding angles are congruent

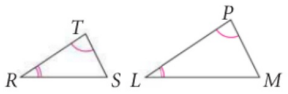
So, yes, these two triangles are similar.

AA similarity Postulate

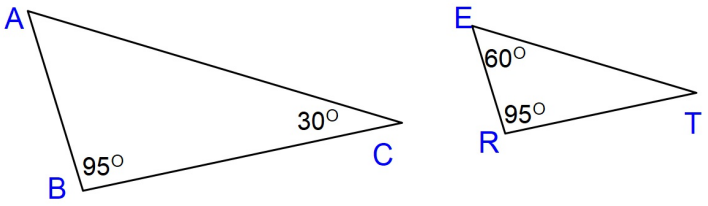
Postulate 7-1 **Angle-Angle Similarity (AA ~) Postulate**

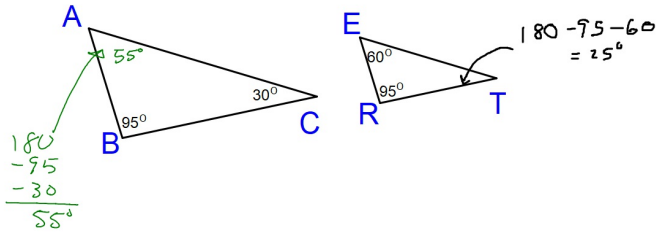
If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.

$\triangle TRS \sim \triangle PLM$



Are the triangles similar?

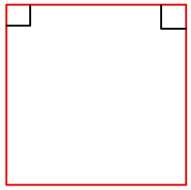




NO, Δ's not similar

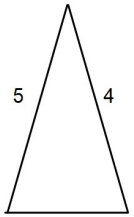
Only one pair of corresponding angles are ≅

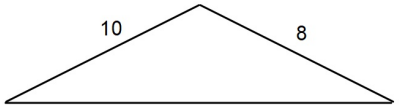
Do you think that showing two pairs of corresponding angles in Quadrilaterals is enough to prove that they are parallel?



These two figures have two pairs of corresponding angles that are ≅ but obviously aren't similar.

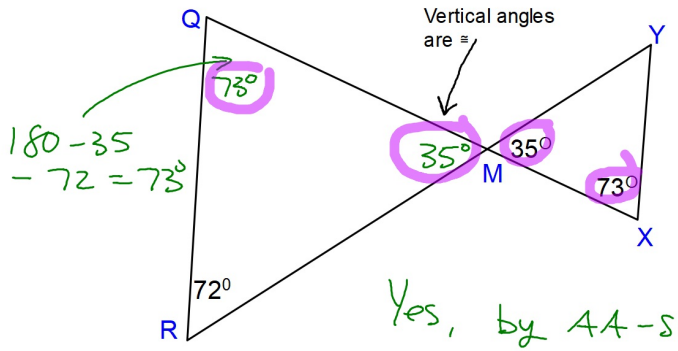
Do you think that there is a Side-Side Similarity Postulate for triangles?





Corresponding sides have the same ratio (2:1) but the triangles are obviously not similar.

Are the triangles similar?



Yes, by AA-Similarity
Δ's are $\sim$

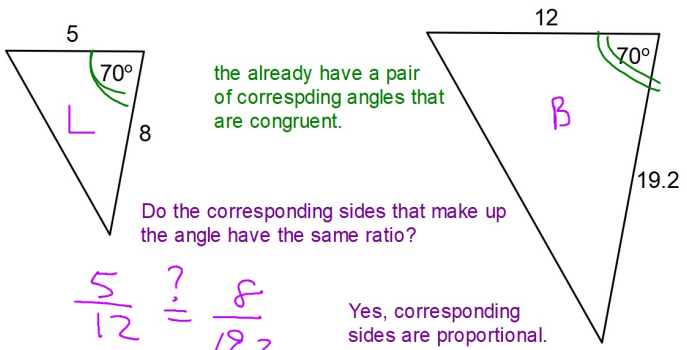
A second way to tell if two triangles are similar:

SAS similarity Theorem

Theorem 7-1 **Side-Angle-Side Similarity (SAS $\sim$) Theorem**

If an angle of one triangle is congruent to an angle of a second triangle, and the sides including the two angles are proportional, then the triangles are similar.

Are these triangles similar?



the already have a pair of correspding angles that are congruent.

Do the corresponding sides that make up the angle have the same ratio?

$\frac{L}{B}$ $\frac{5}{12} \stackrel{?}{=} \frac{8}{19.2}$

Yes, corresponding sides are proportional.

$0.41\overline{6} = 0.41\overline{6}$

By SAS similarity theorem these triangles are similar.

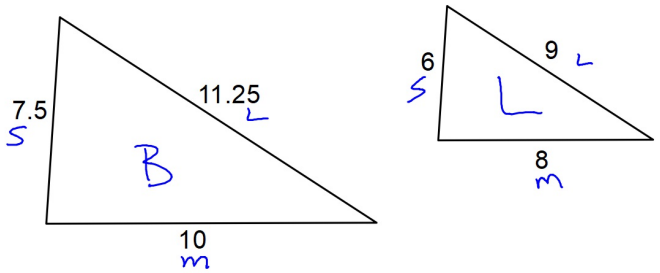
A third way to tell if two triangles are similar:

SSS similarity Theorem

Theorem 7-2 **Side-Side-Side Similarity (SSS $\sim$) Theorem**

If the corresponding sides of two triangles are proportional, then the triangles are similar.

Are these triangles similar?



Do all three pairs of corresponding sides have the same ratio?

If you match them up: Small w/ small, med w/ med, and Lg w/ lg:

$\frac{B}{L}$

$\frac{7.5}{6} = 1.25$

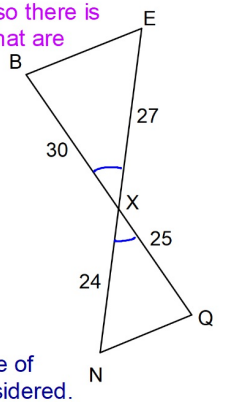
$\frac{10}{8} = 1.25$

$\frac{11.25}{9} = 1.25$

All pairs of corresponding sides have the same ratio: Therefore, the triangle are similar by SSS similarity theorem.

Are these triangles similar? If yes, write a similarity statement.

Vertical angles are congruent so there is pair of corresponding angles that are congruent.



Now we must determine if the corresponding sides that form these angles have the same ratio.

The sides could correspond in one of two ways. Thy both must be considered.

One way they might correspond:

$\frac{30}{25} \stackrel{?}{=} \frac{27}{24}$

$1.2 \neq 1.125$

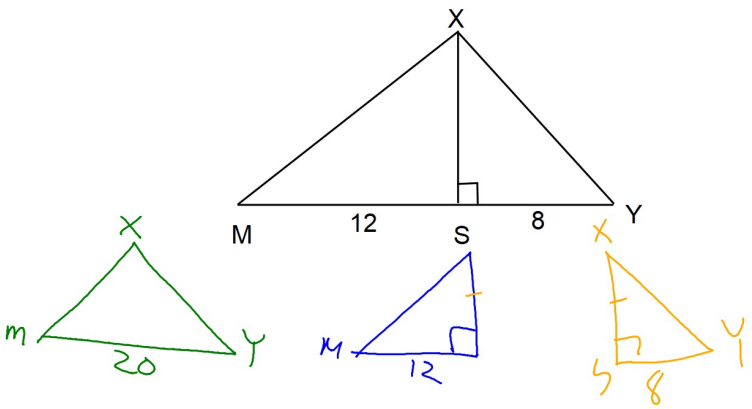
Another way they might correspond:

$\frac{30}{24} \stackrel{?}{=} \frac{27}{25}$

$1.25 \neq 1.08$

Either way, corresponding sides don't have the same ratio, therefore, the triangles are NOT similar.

Are there similar triangles in the figure? If yes, write a similarity statement.



There isn't enough information or the correct information to show that any of the three triangles are similar.

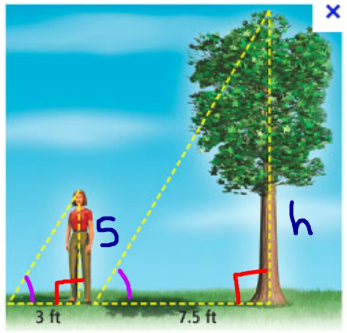
Indirect Measurement.

Finding a distance that is difficult to physically measure by using similar triangles

The sun is shining and casts a shadow of a tree and a woman. Are these triangles similar?

Yes, by AA similarity postulate: Both the tree and woman make a right angle with the ground and the sun makes the same angle with the ground for both of them

A 5ft tall lady casts a 3ft long shadow. If the shadow of the tree is 7.5 feet long how tall is it?



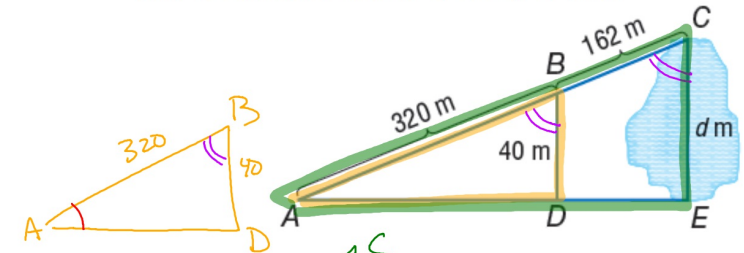
$\frac{h}{5} = \frac{7.5}{3}$

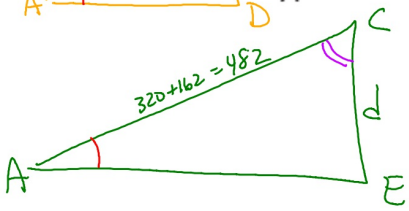
$h = 12.5$ ft

Given $\overline{BD}$ and $\overline{CE}$ are parallel, why are the triangles similar?

AA similarity postulate. The both have angle A and cooresponding angles B and C.

Find the distance across the body of water

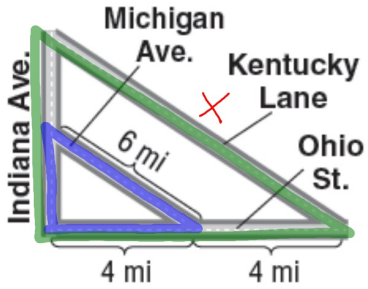


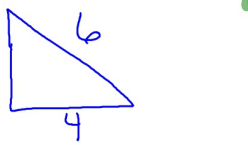


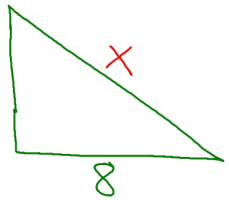
$\frac{320}{482} = \frac{40}{d}$

$d = 60.25$

Given the triangles are similar, find the length of Kentucky Lane.







$\frac{4}{8} = \frac{6}{x}$

$x = 12$ mi

Hwk #12

Sec 7-3

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Problems 4-6, 16-19, 28