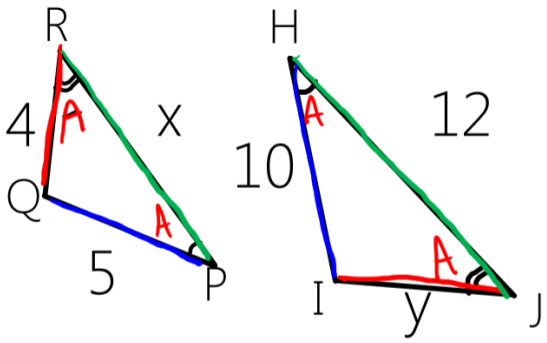
Warm - Up

1. Are the following triangles similar? How do you know? If they are, find the missing values.



Similar by AA. $\angle PRQ \cong \angle HJI$ and $\angle QRP \cong \angle IJH$. So, $\triangle PRQ \cong \triangle HJI$.

$\frac{y}{4} = \frac{10}{5}$ $\qquad$ $\frac{12}{x} = \frac{10}{5}$

$5y = 40$ $\qquad$ $10x = 60$

$y = 8$ $\qquad$ $x = 6$

Goals For Today

Review AA Theorem

SSS and SAS Theorem

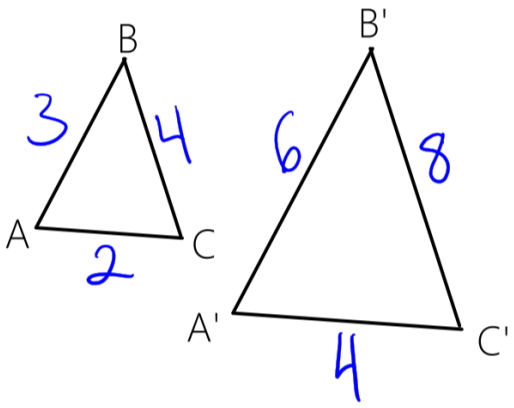
SSS Similarity Theorem

If all three pairs of corresponding sides of two triangles are proportional to each other, then the two triangles are similar.

Triangle Similarity

Let's break that down with something we already know.

To start off triangle ABC is dilated to triangle A'B'C'.



Did the triangles size change proportionally? (By a scale factor) yes they did

$\frac{8}{4} = \frac{6}{3} = \frac{4}{2}$ $2 = 2 = 2$

Did the triangles shape (angles) change?

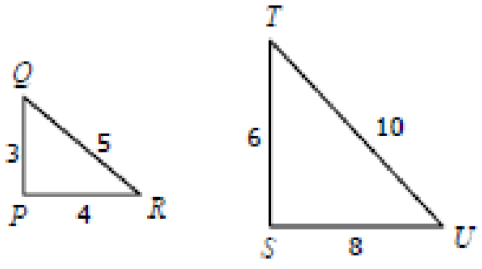
No they didn't.

So all angles are corresponding and congruent

Example SSS

Triangle Similarity Postulates

8)



$\frac{10}{5} = \frac{8}{4} = \frac{6}{3}$

$2 = 2 = 2$

Similar by SSS because the corresponding sides are proportional.

$\triangle QRP \sim \triangle TUS$

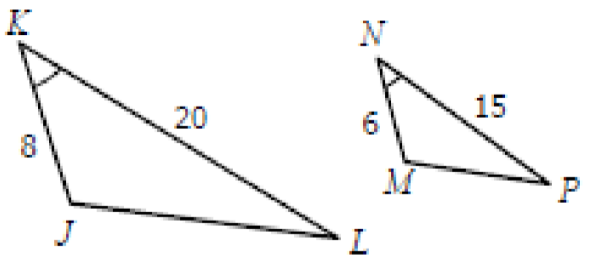
*Notice we don't know anything about the angles, but we can still say they are similar.

SAS Similarity Theorem

If two pairs of corresponding sides are proportional and the included angles are congruent, then the triangles are similar.

SAS Similarity Example

5)



$\frac{8}{6} = \frac{20}{15}$ $\angle JKL \cong \angle MNP$

$\frac{4}{3} = \frac{4}{3}$ ✓

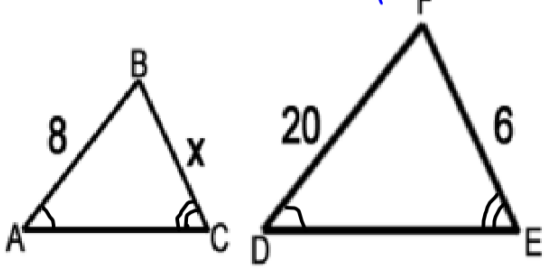
Similar by SAS because the corresponding sides are proportional and corresponding angles are congruent.

$\triangle JKL \sim \triangle MNP$

*Notice we only know 2 sides and the included angle in each triangle but we can still say they are similar.

△ABC is similar to △DFE. Find the value of x.

Sides are proportional



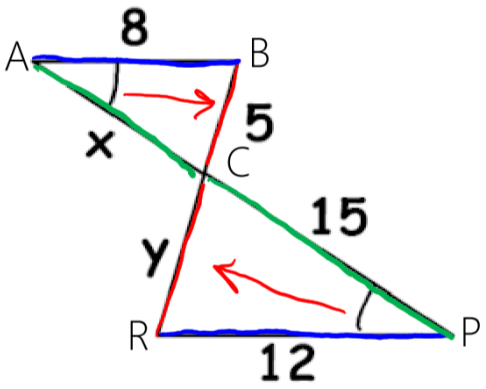
$\frac{20}{8} = \frac{6}{x}$

$20x = 48$

$x = 2.4$

Triangle Similarity

Determine if the following triangles are similar. If they are find the value of x and y.



Similar by AA. $\angle BAC \cong \angle RPC$ and $\angle ACB \cong \angle PCB$ by vertical angles.
So, $\triangle ABC \sim \triangle PRC$.

$\frac{12}{8} = \frac{y}{5}$ $\quad$ $\frac{12}{8} = \frac{15}{x}$

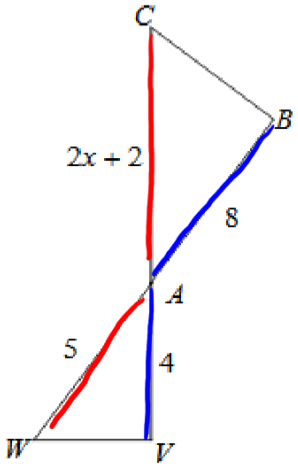
$8y = 60$ $\quad$ $12x = 120$

$y = 7.5$ $\quad$ $x = 10$

sides are proportional

Triangle Similarity

The two triangles shown are similar. What is the value of x?



$\frac{8}{4} = \frac{2x+2}{5}$

$40 = 4(2x+2)$

$40 = 8x + 8$

$\frac{32}{8} = \frac{8x}{8}$

$x = 4$