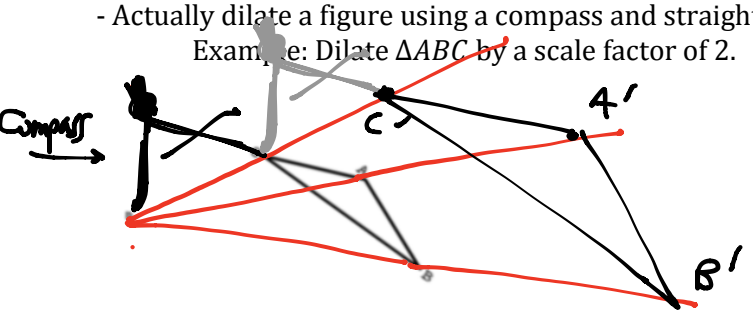
Connect vertices to the center of dilation with straight line passing thru points. Use compass to measure distance from center to A. Then copy that distance from point A using the rigid compass and mark as needed.

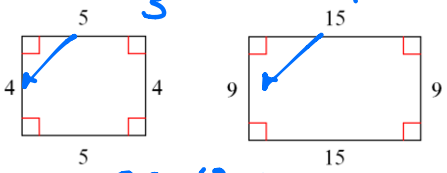
- Explain in words how to dilate a figure using a compass and a straightedge and a given center of dilation.
- Actually dilate a figure using a compass and straightedge and a center of dilation.

Example: Dilate ΔABC by a scale factor of 2.



- Given two non-triangular figures, decide if they are similar. If so, provide the scale factor.

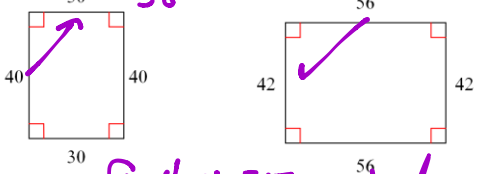
Example:



$\frac{15}{5}=3$ $\quad \frac{9}{4}=2.25$

$2.25 \neq 3$, so Not Similar

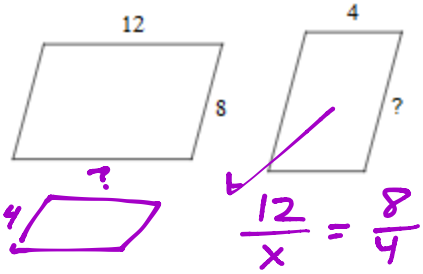
Remember!
AA~, SAS~, and SSS~ only work for TRIANGLES



$\frac{40}{56}=\frac{5}{7}$ $\quad \frac{30}{42}=\frac{5}{7}$

Similar; 5:7 ratio/scale.

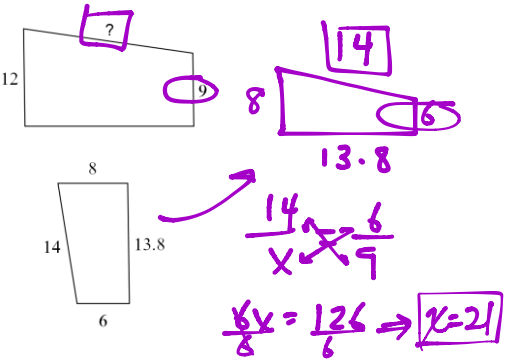
- Given two figures that are stated to be similar, find the missing side length.



$\frac{12}{x}=\frac{8}{4} \Rightarrow \frac{4x}{4}=\frac{8}{4}$

$x=6$

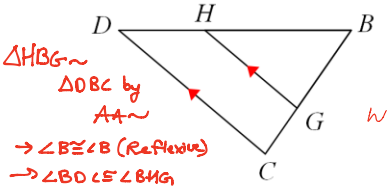
Be mindful of how you set up your proportions. Be Consistent!



$\frac{14}{x}=\frac{6}{9}$

$\frac{6x}{6}=\frac{126}{6} \Rightarrow x=21$

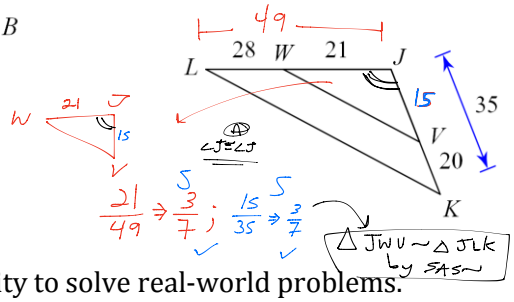
- Given two triangles, determine if they are similar and explain how you know (which shortcut you can use). If not, explain why they are not similar.



$\Delta HBG \sim \Delta DBC$ by AA~

$\rightarrow \angle B \cong \angle B$ (Reflexive)

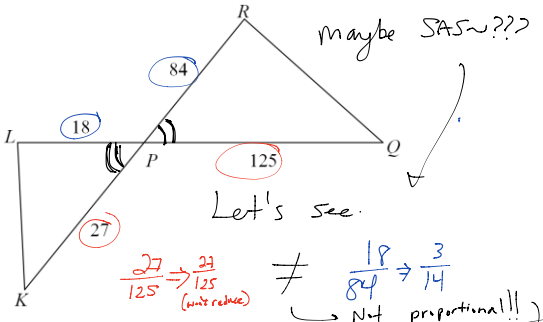
$\rightarrow \angle BDC \cong \angle BHG$ (Corresponding $\angle$'s of // lines)



$\frac{21}{49} \Rightarrow \frac{3}{7}$; $\frac{15}{35} \Rightarrow \frac{3}{7}$

$\angle J \cong \angle J$

$\Delta JWV \sim \Delta JLK$ by SAS~



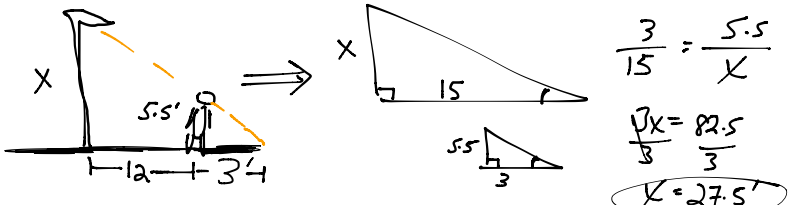
$\frac{27}{125} \Rightarrow \frac{27}{125}$ (units reduce) $\neq \frac{18}{84} \Rightarrow \frac{3}{14}$

Not proportional!!!

No Similarity

- Use triangle similarity to solve real-world problems.

Ex:. A 5.5 foot person stands 12 feet from the base of a light post. Her shadow is 3 feet long. How tall is the post?



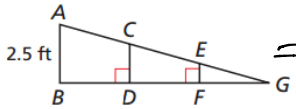
$\frac{3}{15}=\frac{5.5}{x}$

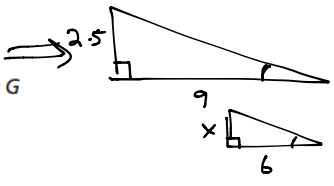
$\frac{3x}{3}=\frac{82.5}{3}$

$x=27.5'$

Ex:

Derrick is building a skateboard ramp as shown. Given that $BD = DF = FG = 3$ ft, find CD and EF to the nearest tenth.





$\frac{2.5}{9}=\frac{x}{6}$

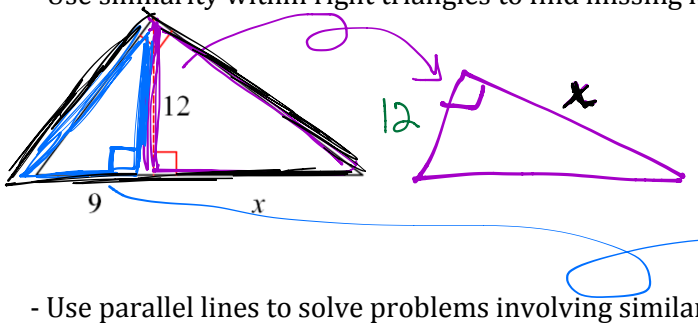
$x=1.6$

$\frac{2.5}{9}=\frac{y}{3}$

$y=0.8$

$y=0.8$

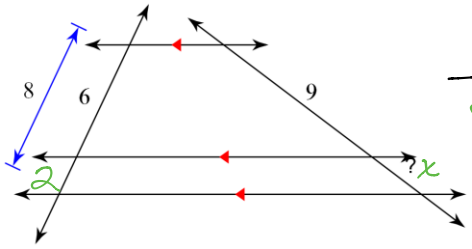
- Use similarity within right triangles to find missing lengths. All 3 Δ's are Similar! TIP Re-arrange the 2 smaller Δs in the same orientation and direction as the original.



$\frac{12}{9} = \frac{x}{12}$

$9x = 144 \Rightarrow x = 16$

- Use parallel lines to solve problems involving similarity

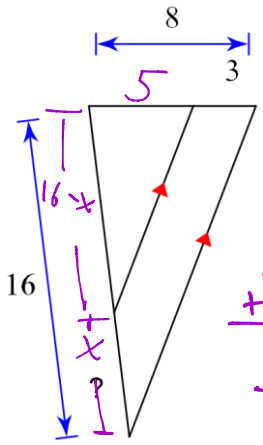


$\frac{6}{2} = \frac{9}{x}$

$6x = 18$

$x = 3$

- Use the side-splitter theorem to find missing lengths.



$\frac{5}{3} = \frac{16-x}{x}$

$5x = 3(16-x)$

$5x = 48 - 3x$

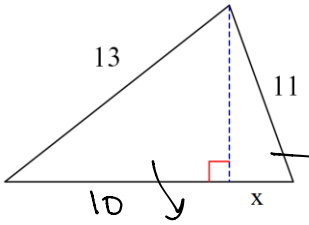
$+3x \quad +3x$

$8x = 48$

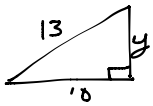
$x = 6$

- Review: Use the Pythagorean theorem one or more times to find missing lengths in triangles.

★ Note difference from 1A / 3A version ★ ("b" refers to diff. length).



Step 1



$10^2 + y^2 = 13^2$

$-100 \quad -100$

$y^2 = 69$

$\sqrt{y^2} = \sqrt{169}$

$y = \sqrt{69}$

Step 2

$x^2 + (\sqrt{69})^2 = 11^2$

$x^2 + 69 = 121$

$-69 \quad -69$

$\sqrt{x^2} = \sqrt{52}$

$x = \sqrt{52} \approx 7.212$

- Review: determine if three lengths will make a triangle, and then classify if it would be right, acute, or obtuse.

Ex: 11cm, 8cm, 7cm

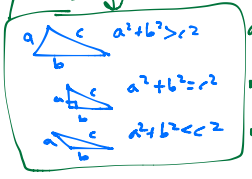
Make a Δ?

$7 + 8 = 15$

$15 > 11$?

yes.

Pythagorean Inequalities



What type?

$7^2 + 8^2$? 11^2

$49 + 64$? 121

$113 < 121$

So c^2 is bigger. ⟹ Δ is obtuse