

Warm Up Problems

Solve for x .

1. $\frac{6}{7} = \frac{3}{x}$

$$6x = 7 \cdot 3$$

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

$$x = \frac{21}{6} = \frac{7}{2}$$

2. $\frac{4x-1}{3} = \frac{2x+5}{4}$

$$4(4x-1) = 3(2x+5)$$

$$16x - 4 = 6x + 15$$

$$\begin{array}{r} -6x \\ -6x \end{array}$$

$$10x - 4 = 15$$

$$\begin{array}{r} +4 \\ +4 \end{array}$$

$$\frac{10x}{10} = \frac{19}{10}$$

$$x = \frac{19}{10}$$

Module 11 So Far...

Dilation is a transformation that makes an image that is the same shape, but may be a different size

$$\text{scale factor} = \frac{\text{image length}}{\text{pre-image length}}$$

*angles are equal
side fractions are
equal*

- “Length” could be side length or distance from center of dilation
- Angles are equal, side lengths are proportional
- Find the center by drawing lines through pre-image and image points

A dilation that has the origin as its center: $(x, y) \rightarrow (kx, ky)$

Similar figures are the same shape but may be a different size

→ Congruent figures are also similar (scale factor is 1)

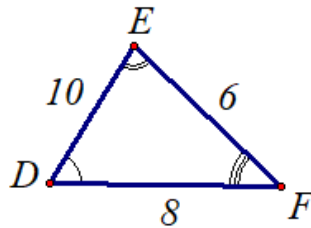
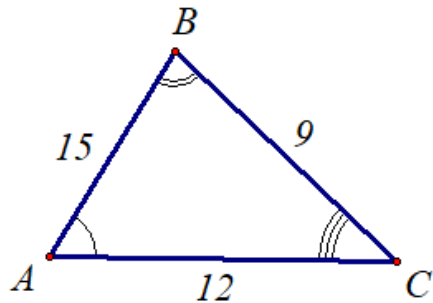
Figures are similar if the image is the result of a sequence of similarity (dilation) or convergence (translation, rotation, reflection) transformations

Corresponding Parts of Similar Figures

Def. Two polygons are similar if their angles are congruent and their sides are proportional.

$$\frac{\text{left}}{\text{right}} = \frac{15}{10} \quad \frac{9}{6} \quad \frac{12}{8}$$

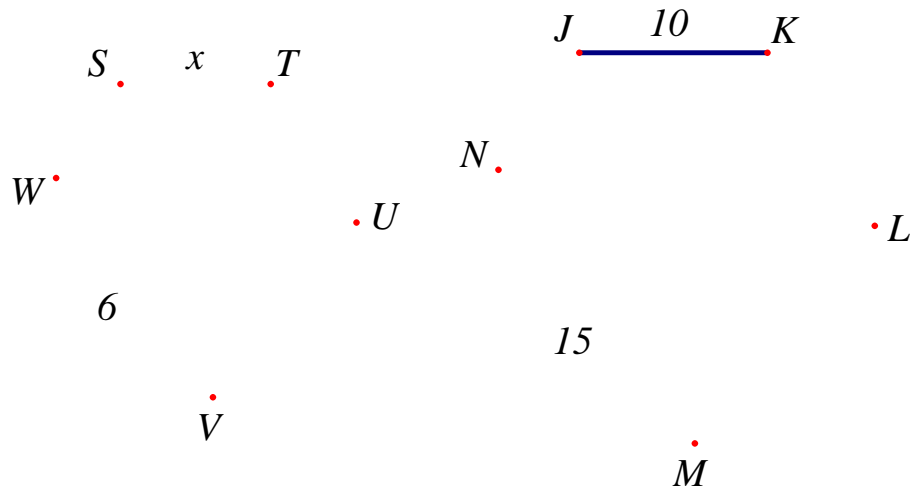
$\underbrace{\hspace{10em}}_{3/2}$



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

$$\text{Scale factor} = \frac{3}{2}$$

Ex. Find x .



$STUVW \sim JKLMN$

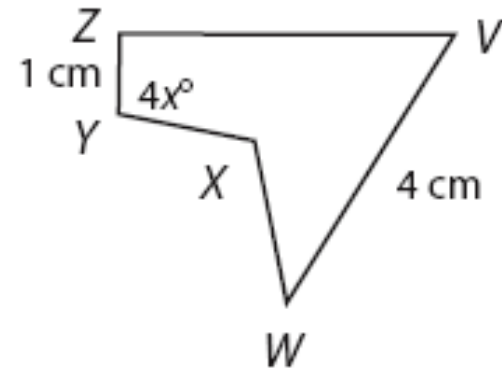
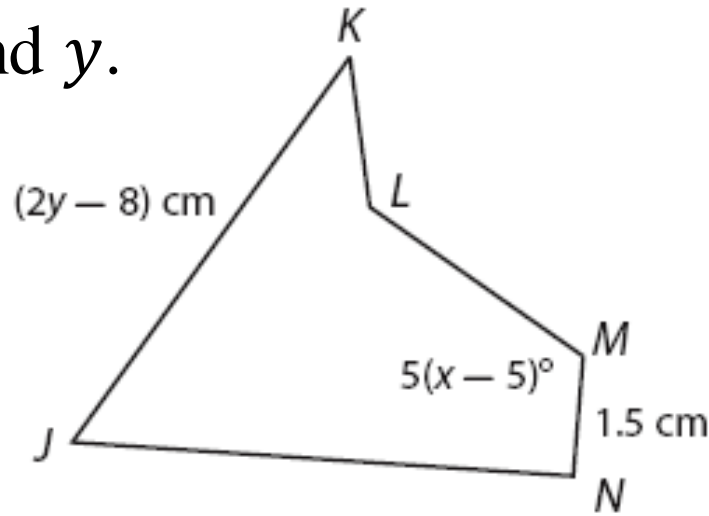
left
right

$$\frac{x}{10} = \frac{6}{15}$$

$$\frac{15}{15}x = \frac{60}{15}$$

$$x = 4$$

Find x and y .



$$\begin{aligned} 5(x-5) &= 4x \\ 5x - 25 &= 4x \\ -8x &\quad -5x \\ -25 &= -x \\ \boxed{x=25} \end{aligned}$$

$JKLMN \sim VWXYZ$

$$\frac{\text{left}}{\text{right}} = \frac{2y-8}{4} = \frac{1.5}{1}$$

$$2y-8 = 4(1.5)$$

$$2y - 8 = 6$$

$$2y = 14$$

$$y = \frac{14}{2} = 7$$

$\boxed{y=7}$

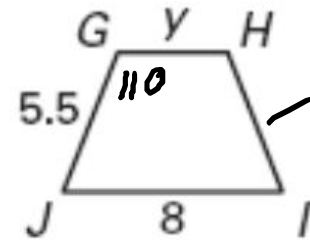
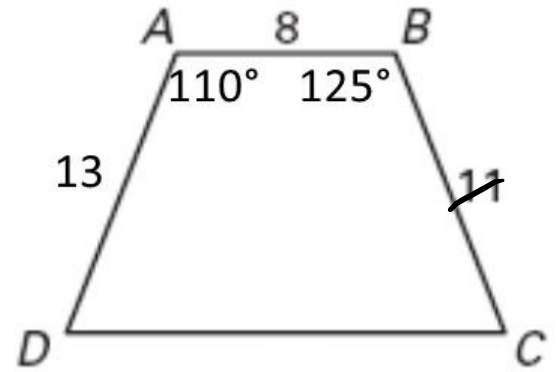
You Try!

If $ABCD \sim GHIJ$, find y and $m\angle G$.

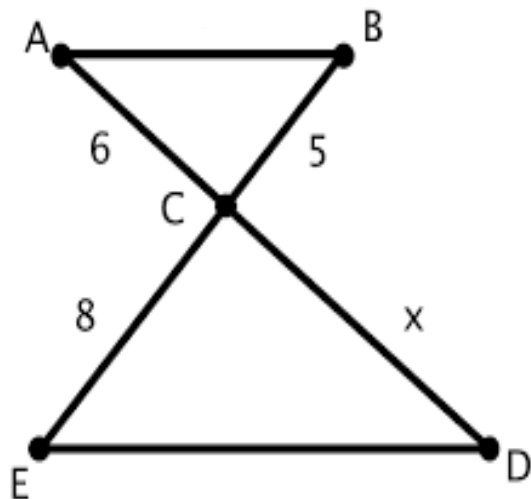
$$\frac{\text{top}}{\text{bottom}} = \frac{8}{y} = \frac{13}{5.5}$$

$$\frac{13}{13}y = \frac{44}{13}$$

$$y = \frac{44}{13}$$



Solve for x given that $\triangle ABC \sim \triangle DEC$

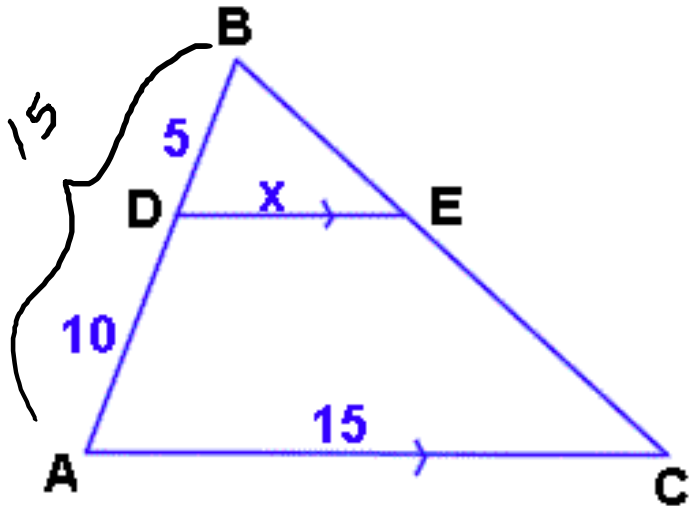


$$\frac{\text{top}}{\text{bottom}} = \frac{6}{x} = \frac{5}{8}$$

$$\frac{5x}{5} = \frac{48}{5}$$

$$x = \frac{48}{5}$$

Solve for x given that $\triangle ABC \sim \triangle DBE$



$\frac{\text{small}}{\text{big}}$

$$\frac{x}{15} = \frac{5}{15}$$

$$15x = \frac{75}{15}$$

$$x = 5$$

Find x and y .

