

Bell Ringer

Wednesday 2/6

Solve each of the following equations:

1. $x^2 + 4x = 3$

$x^2 + 4x - 3 = 0$

$-4 \pm \sqrt{4^2 - 4(1)(-3)}$

$2(1)$

$x = .646$

$x = -3$



2. $0 = 2x^2 + 8$

$-8 = 2x^2$

$\frac{-8}{2} = \frac{2x^2}{2}$

$-4 = x^2$

$\pm 2i = x$



3. $2x^2 - 5x + 2 = 0$

$(2x^2 - 1x)(4x + 2) = 0$

$x(2x - 1) = 2(2x - 1) = 0$

$(2x - 1)(x - 2) = 0$

$2x - 1 = 0$

$x = \frac{1}{2}$

$x - 2 = 0$

$x = 2$

~~$\frac{-1 \pm \sqrt{4 - 5}}{-5}$~~

Correct 10.6 Dilations ws

10.6 Dilations

Name Key Hr _____

1. If a segment AB having length 2 in. is dilated with a scale factor of 3, what is the length of A'B'?

$2(3) = 6$

2. If an equilateral triangle ΔTRI whose side length is 4 m. is dilated with a scale factor of $1/2$, what is the length of the sides of $T'R'I'$?

$4(\frac{1}{2}) = 2$

3. If a square SQRE that had side lengths of 5cm has been dilated to $S'Q'R'E'$ with side lengths of 15cm, what was the scale factor of the dilation?

$\frac{15}{5} = 3$

4. Plot the rectangle ABCD formed with the points $A(-1, -2)$, $B(3, -2)$, $C(3, 1)$, and $D(-1, 1)$ onto the graph. Use the method from the problem task to enlarge it from the origin by a factor of 3. Label this new rectangle $A'B'C'D'$.

a. What are the dimensions of the rectangle, ABCD?

4×3

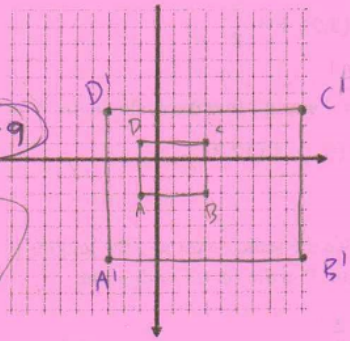
b. What are the dimensions of the enlarged rectangle, $A'B'C'D'$?

12×9

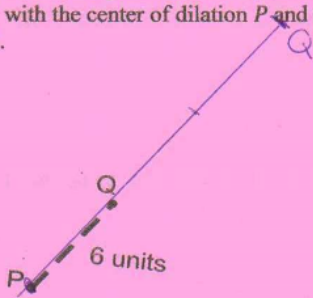
$A' = (-3, -6)$ $B' = (9, -6)$ $C' = (9, 3)$ $D' = (-3, 3)$

c. How does the length of AB compare to A'B'?

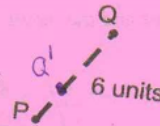
$AB = 4$ $\frac{1}{3}$ of $A'B'$
 $A'B' = 12$ 3 times longer



5. Given the segment below PQ draw the dilation PQ' with the center of dilation P and the scale factor of 3.

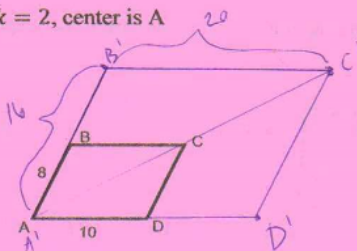


6. Now find the dilation PQ'' using the scale factor of $1/3$.

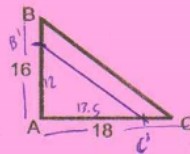


For the given shapes, draw the dilation, given the scale factor and center.

7. $k = 2$, center is A

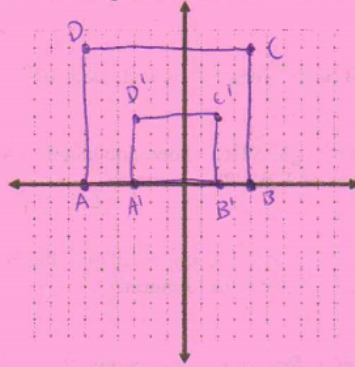


8. $k = \frac{3}{4}$, center is A



Plot the points, connect the points with lines to create the shape, then dilate it with the origin as the center of dilation by the given scale factor.

9. $A(-6, 0)$ $B(4, 0)$ $C(4, 8)$ $D(-6, 8)$; $k = \frac{1}{2}$
 $A'(-3, 0)$ $B'(2, 0)$ $C'(2, 4)$ $D'(-3, 4)$



Given A and the scale factor k , determine the coordinates of the dilated point, A' . You may assume the center of dilation is the origin.

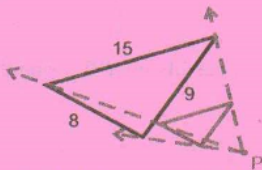
10. $A(3, 9)$, $k = \frac{2}{3}$ $3(\frac{2}{3})$ $9(\frac{2}{3})$ $A' = (2, 6)$
 11. $A(-4, 6)$, $k = 2$ $-4(2)$ $6(2)$ $A' = (-8, 12)$

Given A and A' , find the scale factor. You may assume the center of dilation is the origin.

12. $A(8, 2)$, $A'(12, 3)$ $\frac{12}{8}$ or $\frac{3}{2} = \frac{3}{2}$
 13. $A(22, -7)$, $A'(11, -3.5)$ $\frac{11}{22}$ or $\frac{-3.5}{-7} = \frac{1}{2}$ *Image preimage*

14. Use the scale factor and the lengths given on the preimage to determine the dimensions of the image or dilation. P is the center of dilation.

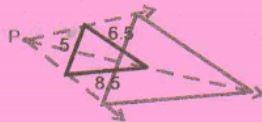
$k = \frac{1}{4}$



$\frac{15}{4}, \frac{9}{4}, 2$

15. Use the scale factor and the lengths given on the Dilation to determine the dimensions of the preimage. P is the center of dilation.

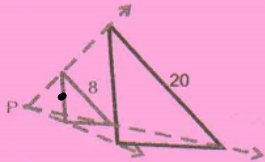
$k = \frac{1}{3}$



$5(3)$ $6.5(3)$ $8.5(3)$
 $15, 19.5, 25.5$

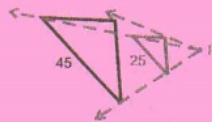
In the two questions below, find the scale factor, given the corresponding sides. In each diagram, the larger figure is the original and P is the center of dilation.

16.



$\frac{8}{20} = \frac{2}{5}$

17.

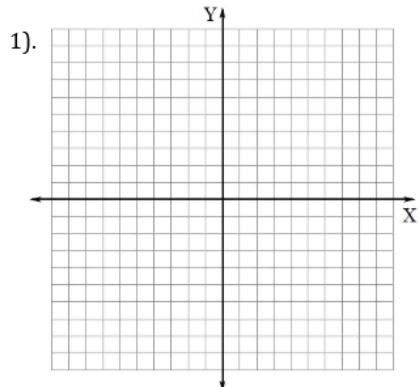


$\frac{25}{45} = \frac{5}{9}$

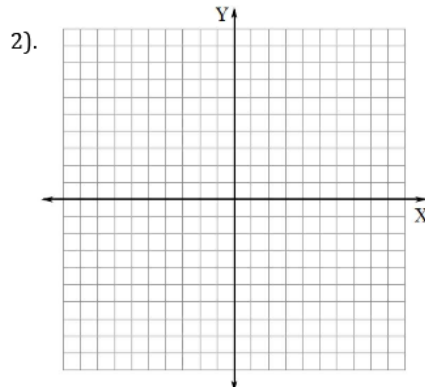
10.7 due tomorrow - questions??

Lesson 10.7 Similarity Transformations Name _____ Date: _____

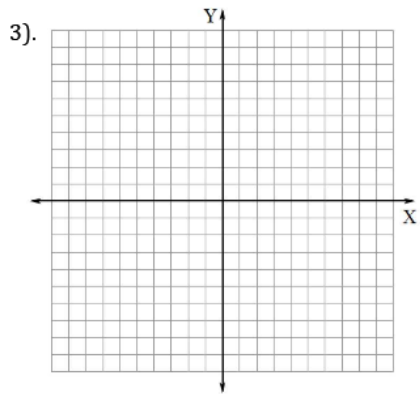
For the following 1-8 sketch the composition of transformations.



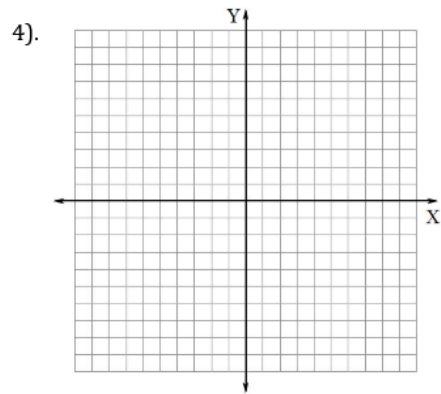
Given: $\triangle ABC$ where $A(0,6)$, $B(6,3)$, $C(3,1)$
 Transformation: right 2, down 1



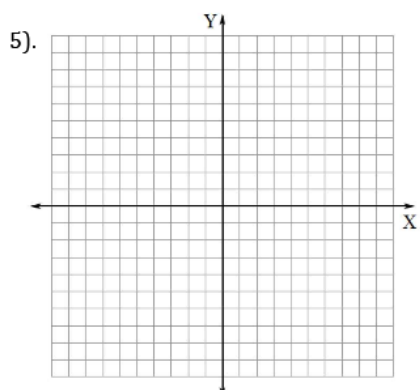
Given: $\triangle ABC$ where $A(0,6)$, $B(6,3)$, $C(3,1)$
 Transformation: left 3, up 4



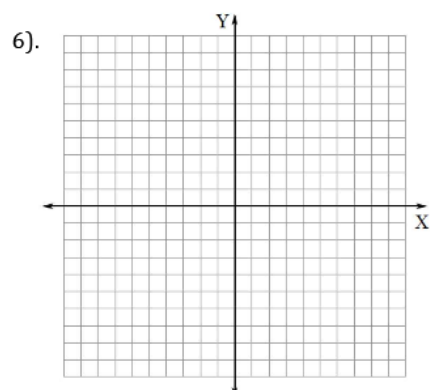
Given: $\triangle ABC$ where $A(2,5)$, $B(4,1)$, $C(7,7)$
 Transformation: reflect over y-axis = $R_{y\text{-axis}}$



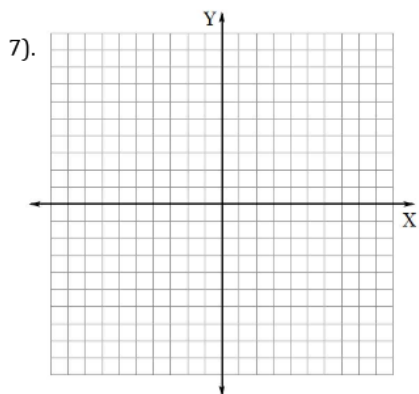
Given: $\triangle ABC$ where $A(2,5)$, $B(4,1)$, $C(7,7)$
 Transformation: $R_{x\text{-axis}}$, right 1, down 1



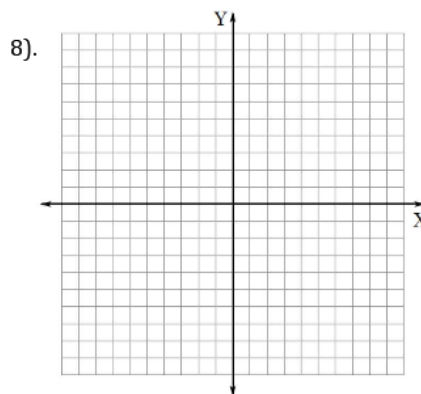
Given: $\triangle ABC$ where $A(1,-5)$, $B(7,0)$, $C(6,-6)$
 Transformation: rotation of 180° about origin = $r_{(180^\circ, 0)}$
 $D_2^1(\triangle ABC)$



Given: $\triangle ABC$ where $A(1,-5)$, $B(7,0)$, $C(6,-6)$
 Transformation: $r_{(90^\circ, 0)}$

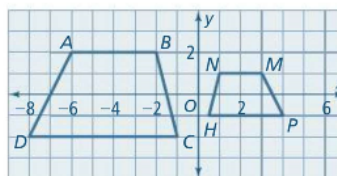


Given: $\triangle ABC$ where $A(-1,-5)$, $B(2,-1)$, $C(0,2)$
 Transformation: right 2, $D_2(\triangle ABC)$

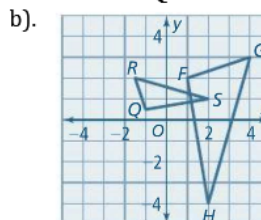
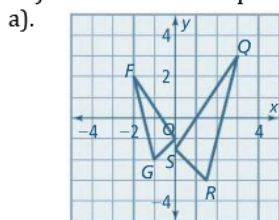


Given: $\triangle ABC$ where $A(-1,-4)$, $B(2,-1)$, $C(0,2)$
 Transformation: $R_{y\text{-axis}}$, $D_3(\triangle ABC)$

9). What is the composition of transformations/rigid motions that maps trapezoid ABCD to trapezoid MNHP?



10). Describe the composition of transformations that maps $\triangle FGH$ to $\triangle QRS$

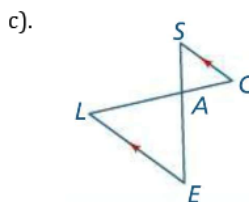
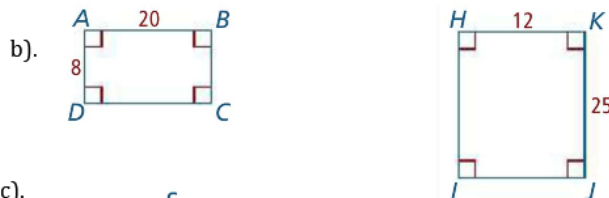
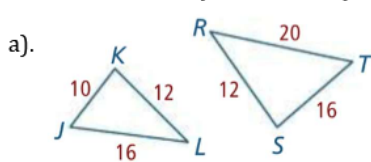


Compositions of rigid motions and dilations map pre-images to similar images. For this reason, they are called similarity transformations. Similarity transformations give you another way to think about similarity.

Take note **Key Concept** Similar Figures

Two figures are **similar** if and only if there is a similarity transformation that maps one figure onto the other.

11). For each pair of figures, determine if there is a similarity transformation that maps one figure onto the other. If so, identify the similarity transformation.



Solving Proportions...

~~$$\frac{x}{7} = \frac{8}{4}$$~~

$$x = 14$$

$$\frac{8 \cdot 7}{4} = \frac{4x}{4}$$

$$\therefore x = 14$$

~~$$\frac{6}{y} = \frac{9}{15}$$~~

$$\frac{9y}{9} = \frac{90}{9}$$

$$\frac{6}{10} = \frac{9}{15}$$

$$y = 10$$

$$\frac{5 \cdot 2}{5} = \frac{30}{5}$$

~~$$\frac{x-9}{12} = \frac{2}{3}$$~~

$$24 = 3(x-9)$$

$$24 = 3x - 27$$

$$+27$$

$$\frac{51}{3} = \frac{3x}{3}$$

$$x = 17$$

Mel puts 6 gallons of gas in his tank and it costs 14.72.
What would it cost to put 13 gallons in Mel's tank?

$$\begin{array}{cc} \text{gal} & \text{cost} \\ \frac{\text{cost}}{\text{gal}} = & \frac{\text{cost}}{\text{gal}} \end{array}$$

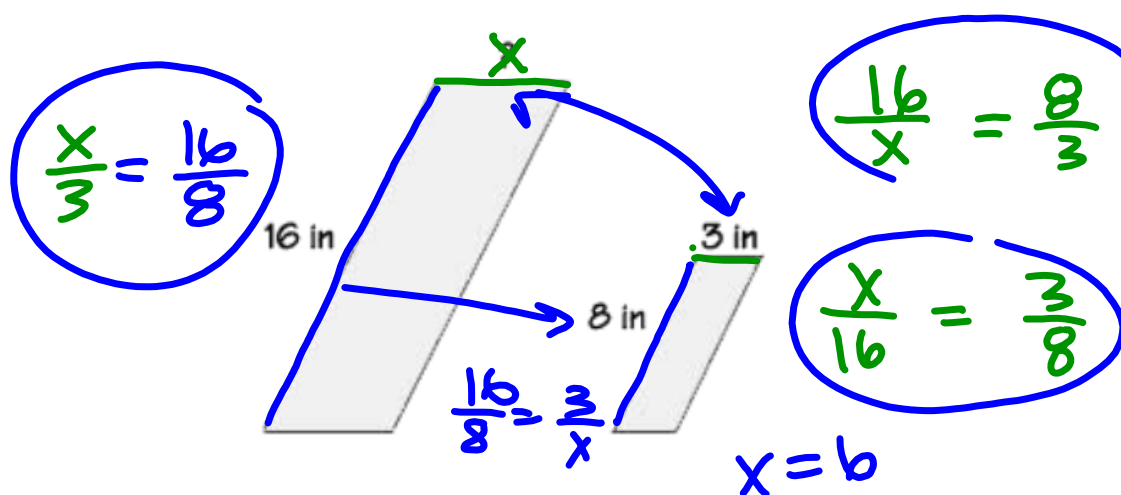
$$\frac{14.72}{6} = \frac{x}{13}$$

$$\frac{6}{6}x = \frac{191.36}{6}$$

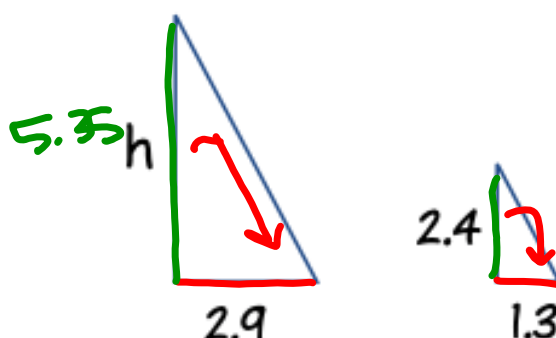
$$x = 31.9$$

Cost for 13 gal

The parallelograms are similar. Find the missing side length.



The triangles are similar. Find the length of h



5.35 h

2.9

2.4

1.3

~~$\frac{h}{2.4} = \frac{2.9}{1.3}$~~

$\frac{h}{2.9} = \frac{2.4}{1.3}$

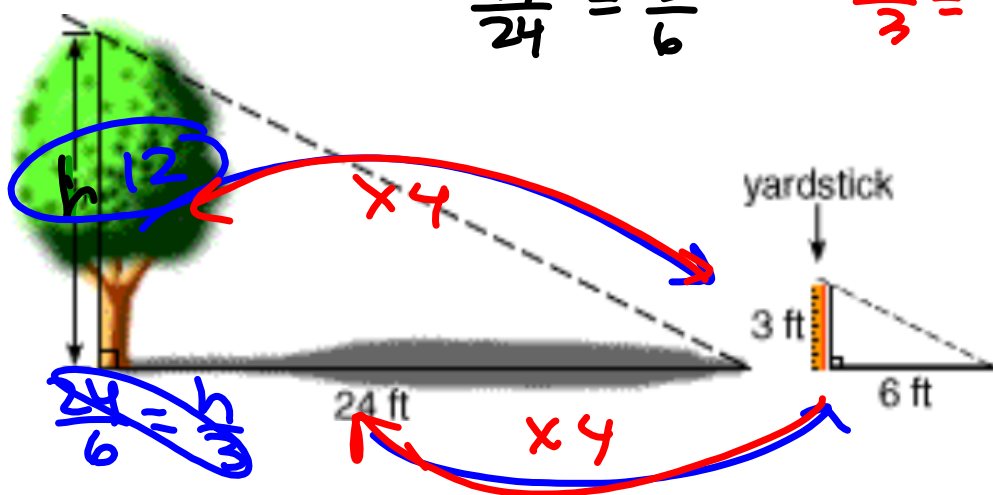
~~$\frac{2.9}{1.3} = \frac{h}{2.4}$~~

$h = 5.35$

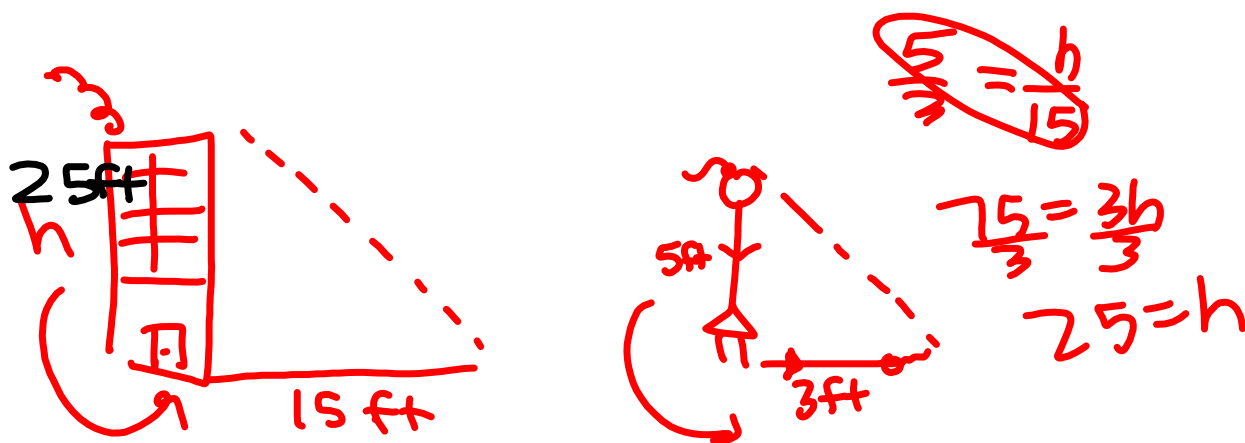
How tall is the tree?

$$\frac{h}{24} = \frac{3}{6}$$

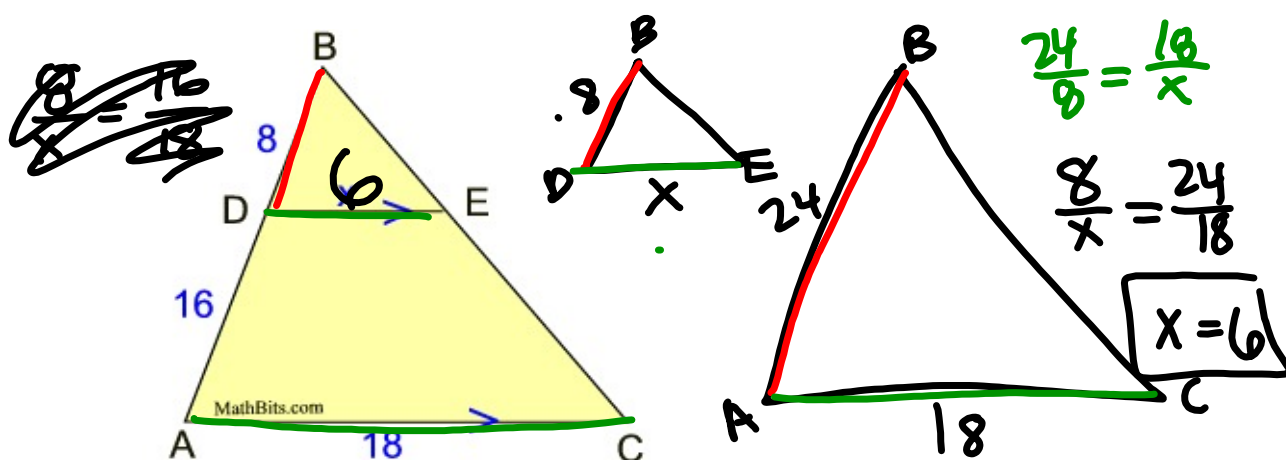
$$\frac{h}{3} = \frac{24}{6}$$



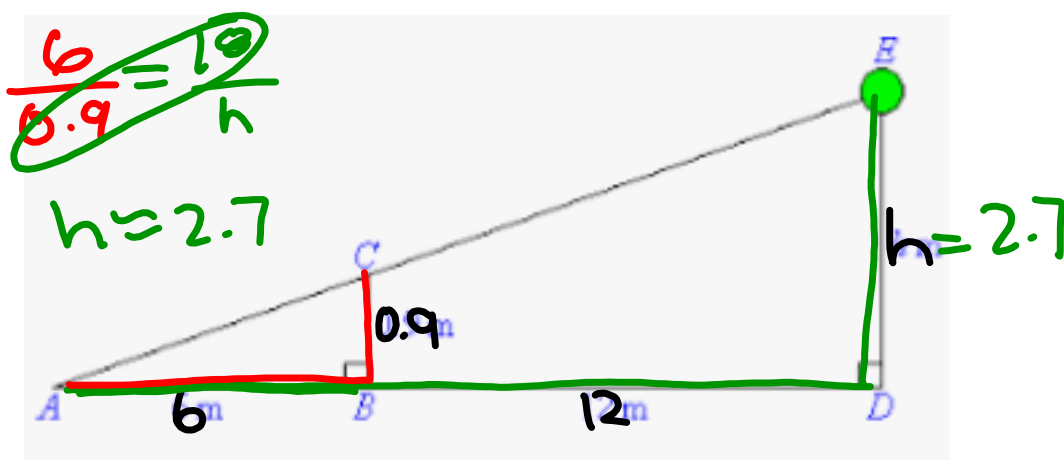
At the same time of day, a 5 foot tall girl casts a shadow of 3 feet. If a building nearby casts a shadow of 15 feet, how tall is the building?



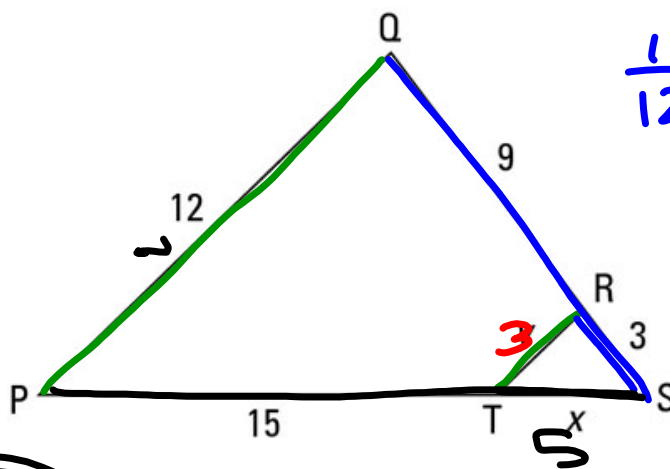
ABC ~ DBE. What is the length of DE?



ABC ~ ADE. Find the length of ED



$PQS \sim TRS$. Find the length of TR and TS



$$\frac{12}{12} = \frac{y}{3}$$

$$y = 3$$

~~$$\frac{3}{12} = \frac{x}{15+x}$$~~

$$3(15+x) = 12x$$

$$45 + 3x = 12x$$

$$-3x \quad -3x$$

$$45 = 9x$$

$$\frac{45}{9} \quad \frac{9x}{9}$$

$$x = 5$$

due Friday

Name: _____ Hr: _____

10.1 Applications using Proportions and Ratios

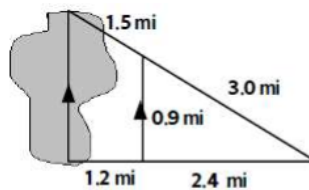
1. $\frac{15}{y} = \frac{40}{12}$

2. $\frac{y}{42.3} = \frac{144}{56.4}$

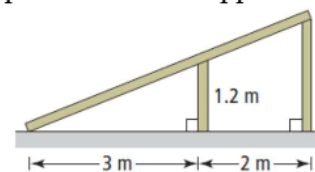
3. $\frac{126}{k+3} = \frac{14}{3}$

4. A 9ft tall stop sign casts a 12ft shadow. A building near this stop sign casts a 63ft shadow.
 a) How tall is the building? b) If the distance from the top of the building to the end of the shadow is 87ft, what is the distance from the top of the stop sign to the end of its shadow?

5. Find the length of the lake.



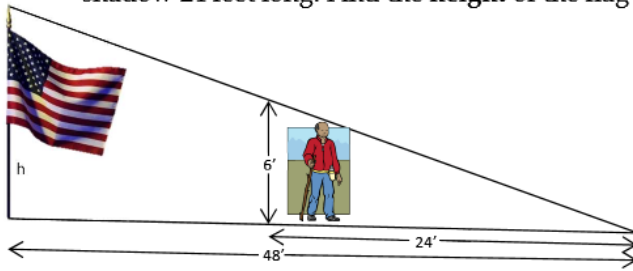
6. A Tower casts a shadow of 64 feet. A 6-foot pole near the tower casts a shadow 8 feet long. How tall is the tower?
7. A ladder that is 30ft tall leans 25ft up against the side of a building. Up against the same building, how far up would a 20ft ladder go?
8. Sam built a ramp to a loading dock. The ramp has a vertical support 2 meters from the base of the loading dock and 3 meters from the base of the ramp. If the vertical support is 1.2 meters in height, what is the height of the loading dock?



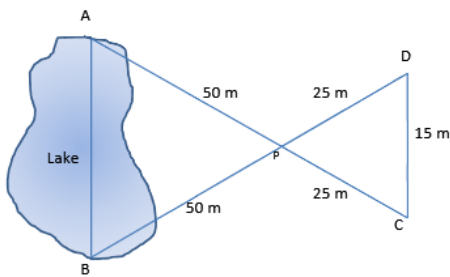
9. Cameron is 5 ft tall and casts a 12 ft shadow. At the same time of day, a nearby building casts a 78 ft shadow. How tall is the building? (Draw a picture)

10. Emily is moving and needs to pack two mirrors. The largest mirror fits in a box that is 18 inches wide by 20 inches long. Her smaller mirror is similar in proportion to the larger mirror. Emily determines that the width of the smaller box needs to be a minimum of 9 inches. What should the minimum length of the box be to hold the smaller mirror?

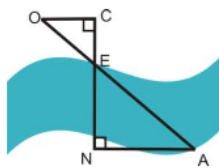
11. A flagpole casts a shadow 48 feet long at the same time that a 6 foot tall person casts a shadow 24 feet long. Find the **height** of the flag pole.



12. Find the length of the **lake** (in meters).



In order to estimate the width of a river, the following technique can be used. Use the diagram on the left for questions 9-13. Place three markers, O, C and E on the upper bank of the river. E is on the edge of the river and $\overline{OC} \perp \overline{CE}$. Go across the river and place a marker, N so that it is collinear with C and E. Then, walk along the lower bank of the river and place marker A, so that $\overline{CN} \perp \overline{NA}$. $OC=50\text{feet}$, $CE=30\text{feet}$, $NA=80\text{feet}$.



13. Is $\overline{OC} \parallel \overline{NA}$? How do you know?
14. What is the width of the river (EN)?
15. Can we find (EA)? If so, find it. If not, explain.

