

Name: KEY

Date: _____

Period: _____

Geometry w/ Trig

Unit 6 Similarity Review

For each problem, show all work!

1. The measure of the angles of a triangle have the ratio 2:4:6. Find the measure of the **largest** angle.

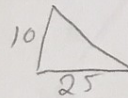
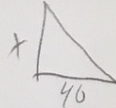
$$2x + 4x + 6x = 180$$

$$12x = 180$$

$$x = 15$$

$$6(15) = 90$$

2. A pole with an American flag casts a shadow 40 feet long. Next to this pole, is a much shorter pole with a New Jersey flag; it is 10 feet high and casts a shadow 25 feet long. What is the height of the pole with the American flag? *Sketch a diagram first:*



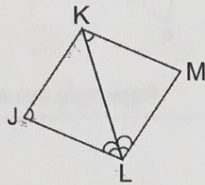
$$\frac{x}{40} = \frac{10}{25} \quad 25x = 400$$

$$x = 16$$

3. Use the diagram below.

a) Complete the similarity statement:

$$\triangle JKL \sim \triangle KML$$



b) State the theorem or postulate used to prove that the triangles are similar. AA

4. If the ratio of the perimeters of two similar triangles is 3:4, what is the ratio of the corresponding **side lengths**? What is the ratio of the **areas**?

Perimeters: $\frac{3}{4}$

Areas: $\frac{9}{16}$

5. The ratio of the lengths of corresponding sides of two similar triangles is 4:11. If the **perimeter** of the **larger** triangle is 22 yards, find the perimeter of the **smaller** triangle.

$$\frac{4}{11} = \frac{x}{22}$$

$$88 = 11x$$

$$x = 8 \text{ yds}$$

6. The ratio of the lengths of corresponding sides of two similar triangles is 4:11. If the **area** of the **smaller** triangle is 48 square yards, find the area of the **larger** triangle.

$$\left(\frac{4}{11}\right)^2 = \frac{16}{121}$$

$$\frac{16}{121} = \frac{48}{x}$$

$$16x = 5808$$

$$x = 363 \text{ yds}$$

7. If the coordinates of the image are $A'(6, 4)$, and $B'(1, 2)$ and $k = \frac{2}{3}$, find the coordinates of the **pre-image**.

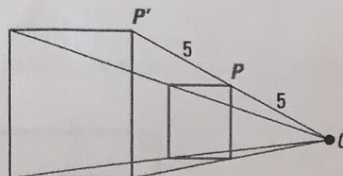
$$(6, 4) \div \frac{2}{3}$$

$$A(9, 6)$$

$$(1, 2) \div \frac{2}{3}$$

$$B\left(\frac{3}{2}, 3\right)$$

8. Identify the dilation as an enlargement or a reduction. Then, find its scale factor.



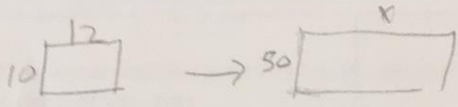
$$\frac{10}{5} = 2$$

Enlargement ; $k = 2$

60 in

a) A photo needs to be enlarged from an original with a length of 12 inches and a width of 10 inches to a size where the new width is 50 inches. What is the new length?

Sketch a diagram first:



$\frac{10}{50} = \frac{12}{x}$
 $10x = 600$
 $x = 60$

Similar

b) Can you describe the two photos as congruent, similar, or neither?

$\frac{1}{5}$

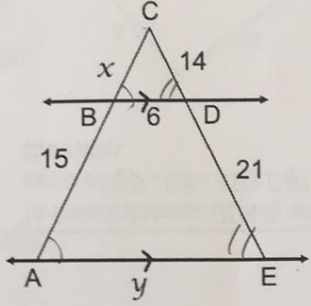
c) What is the scale factor of the original photo to the enlarged photo?

10) $\triangle CAE \sim \triangle CBD$ a) Write a similarity statement for the diagram to the right.

10 b) Find x.

$\frac{x}{15} = \frac{14}{21}$
 $21x = 210$
 $x = 10$

$\frac{6}{14} = \frac{y}{35}$
 $210 = 14y$
 $y = 15$



15 c) Find y.

11) Given: $\triangle SKI \sim \triangle RUN$ answer the following questions. (Hint: Sketch a diagram.)

NR a) Complete the proportion: $\frac{SK}{RU} = \frac{IS}{?}$

<R b) Name the angle in RUN that is congruent to $\angle S$.

24 c) If $SK = 6$ in., $KI = 3$ in., and $UN = 12$, find RU .

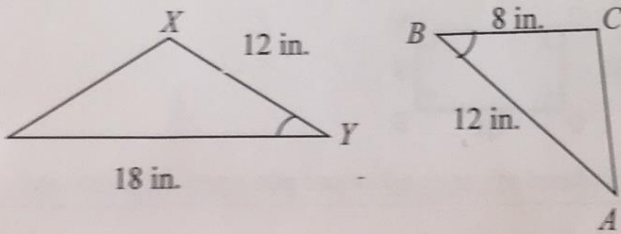
$\frac{6}{3} = \frac{x}{12}$
 $72 = 3x$
 $x = 24$

12) The perimeter of a rectangular living room is 88 feet. The ratio of the width to length is 4:7. What is the area of the living room?

$4x + 4x + 7x + 7x = 88$
 $22x = 88$
 $x = 4$

$4(4) = 16$
 $7(4) = 28$
 $A = 16 \cdot 28 = 448 \text{ ft}^2$

13) Are the triangles similar? If yes, state which postulate or theorem proves that they are similar and write a similarity statement.



$\frac{8}{12} = \frac{12}{18}$
 $144 = 144 \checkmark$

Yes
 $\triangle XYZ \sim \triangle CBA$
by SAS

Refer to the diagram to the right to answer the following questions.

ΔSTR a) $\Delta PQR \sim \Delta STR$

AA b) Which **postulate/theorem** justifies your answer to part (a)?

$\frac{10}{25} = \frac{2}{5}$ c) Find the **scale factor** from the **smaller** triangle to the **larger** triangle.

8.8 d) If $PQ = 22$, then $TS =$ _____ $\frac{22}{25} = \frac{x}{10}$ $x = 8.8$
 $220 = 25x$

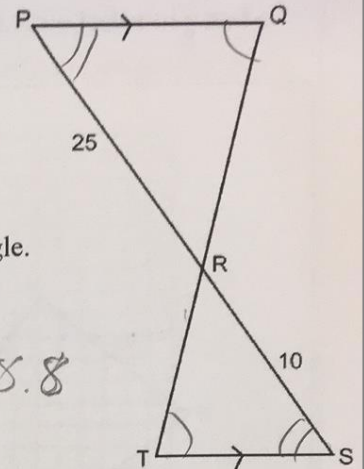
2 : 5 e) What is the ratio of the perimeters from ΔSTR to ΔPQR ?

4 : 25 f) What is the ratio of the areas from ΔSTR to ΔPQR ?

12 g) If the area of ΔPQR is 75 ft^2 , then what is the area of ΔSTR ?

$$\frac{14}{25} = \frac{x}{75} \quad x = 12$$

$$300 = 25x$$



15) Use the diagram below to answer each question.

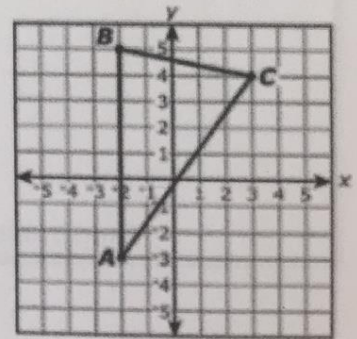
a) List the coordinates of ΔABC .

$A(-2, -3)$ $B(-2, 5)$ $C(3, 4)$

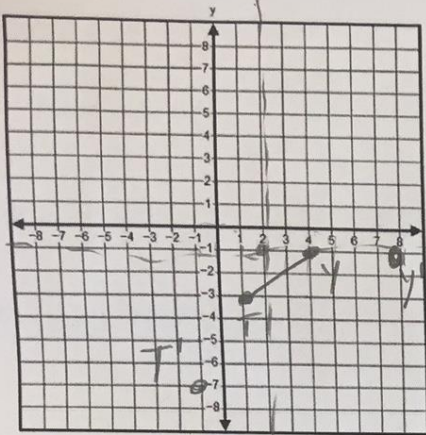
b) Given $B'(-8, 20)$ under a dilation with center $(0, 0)$, find the scale factor. Then find A' and C' .

$$\frac{-8}{-2} = 4$$

$k =$ 4; A' $(-8, -12)$; C' $(12, 16)$



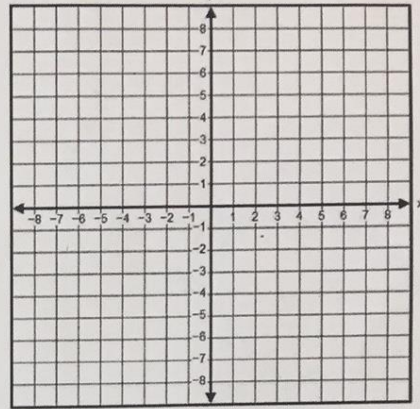
16) Given $\overline{T'Y'}$ with $T'(1, -3)$ and $Y'(4, -1)$ is dilated by a scale factor of 3 with center $(2, -1)$, find the coordinates of the image. The graph is optional.



False $T'(-1, -2)$
 False $T'(-3, -6)$
 False $Y'(2, 0)$
 False $Y'(6, 0)$
 $Y'(8, -1)$

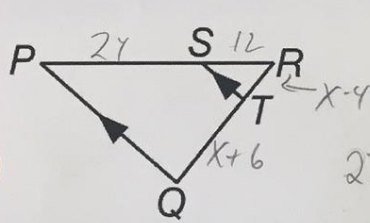
$T''(-1, -7); Y''(8, -1)$

17) Find the equation of the image of $y = -2x - 4$ shown under a dilation with a scale factor of $\frac{1}{2}$ and a center at $(0, 0)$. Write the equation in slope-intercept form. The graph is optional.



$y = -2x - 2$

18) If $QT = x + 6$, $SR = 12$, $PS = 27$, and $TR = x - 4$, find QT and TR .



$$\frac{x-4}{x+6} = \frac{12}{27}$$

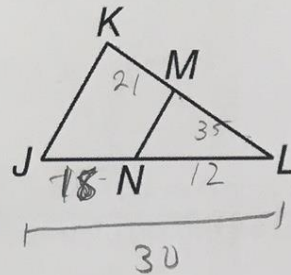
$$27x - 108 = 12x + 72$$

$$15x = 180$$

$$\boxed{x = 12}$$

$QT = 18 \quad TR = 8$

19) Given: $JN = 18$, $JL = 30$, $KM = 21$, and $ML = 35$. Determine whether $\overline{JK} \parallel \overline{NM}$. Justify your answer.

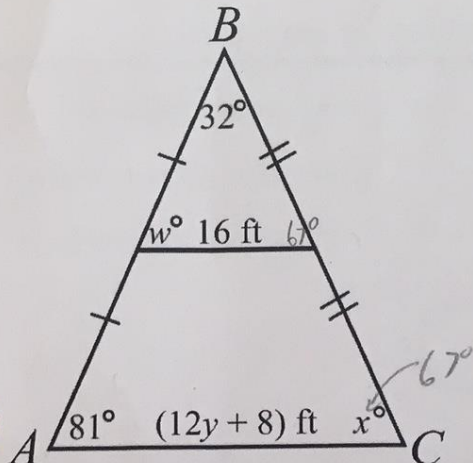


$$\frac{21}{35} = \frac{18}{12}$$

$$252 \neq 630$$

Not Parallel

20) Find the missing variables, w , x , and y .



$$\frac{1}{2} = \frac{16}{12y+8}$$

$$12y + 8 = 32$$

$$12y = 24$$

$$y = 2$$

$w = 81; x = 67; y = 2$