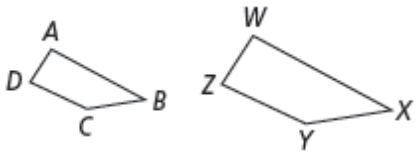
Math 2 Unit 6 Worksheet 1 **Name:**_____
Similar Polygons **Date:**_____ **Per:**_____

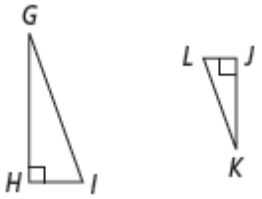
[1-2] List the pairs of congruent angles and the extended proportion that relates the corresponding sides for the similar polygons.

1. 

$\angle A \cong$ _____ $\angle B \cong$ _____

$\angle C \cong$ _____ $\angle D \cong$ _____

$\frac{AB}{WX} = \frac{BC}{XY} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

2. 

$\angle G \cong$ _____ $\angle H \cong$ _____

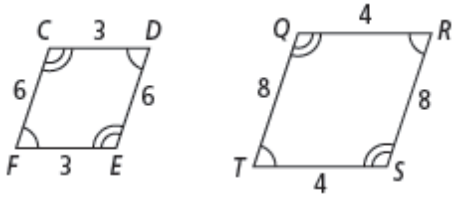
$\angle I \cong$ _____

$\frac{GH}{KJ} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

[3-6] Determine whether the polygons are similar.

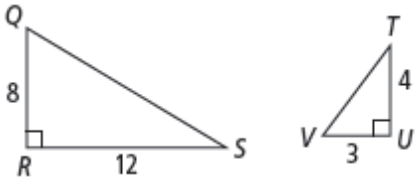
a) Give the scale factor of the left polygon to the right polygon. If not similar, write 'not similar' for both 'a' and 'b' and explain.

b) Complete the statement of similarity.

3. 

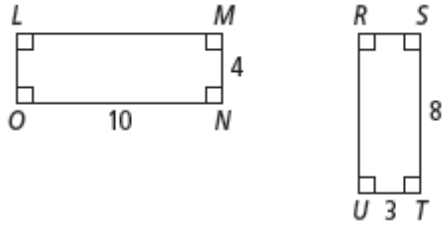
a) SF = _____

b) $CDEF \sim$ _____

4. 

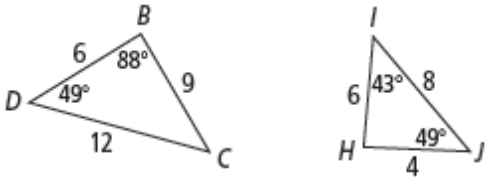
a) SF = _____

b) $\Delta QRS \sim$ _____

5. 

a) SF = _____

b) $LMNO \sim$ _____

6. 

a) SF = _____

b) $\Delta BCD \sim$ _____

7. In the diagram below, $\Delta NOP \sim \Delta WXY$. Find each of the following:

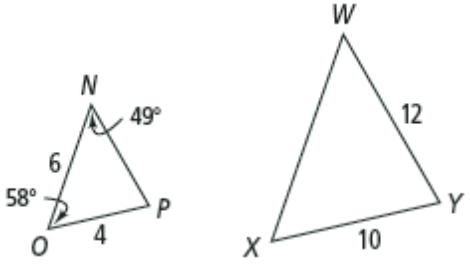
a) the scale factor of ΔNOP to $\Delta WXY =$ _____

b) $m\angle X =$ _____

c) $m\angle Y =$ _____

d) $WX =$ _____

e) $NP =$ _____



8. In the diagram below, $\Delta PRQ \sim \Delta DEF$. Find each of the following:

   a) the scale factor of ΔPRQ to ΔDEF = _____

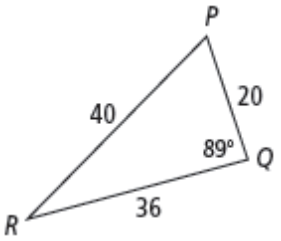
   b) $m\angle D$ = _____

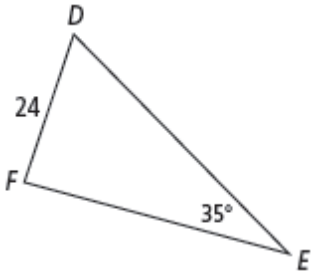
   c) $m\angle R$ = _____

   d) $m\angle P$ = _____

   e) DE = _____

   f) FE = _____





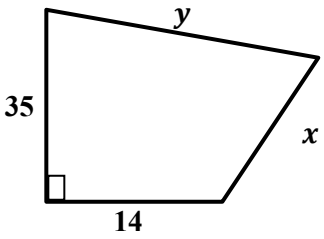
9. The quadrilaterals shown are similar. Find the scale factor of the larger quadrilateral to the smaller, then find the values of x, y, and z.

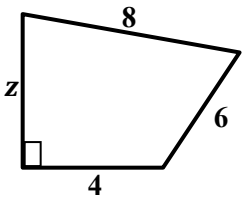
   a) the scale factor _____

   b) x = _____

   c) y = _____

   d) z = _____



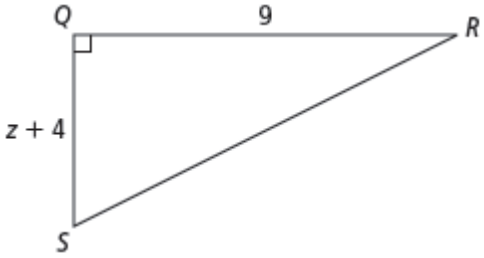


10. Find the value of z. Give the scale factor of the polygons.

    $\Delta JKL \sim \Delta QRS$

    a) z = _____

    b) the scale factor of ΔJKL to ΔQRS = _____

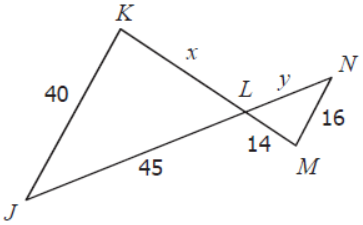


[11-20] Given the similar polygons, use a proportion to find the value of each variable.

11. $\Delta JKL \sim \Delta NML$

    a) x = _____

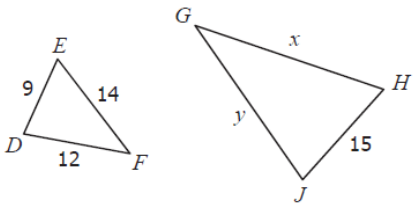
    b) y = _____



12. $\Delta DEF \sim \Delta HJG$

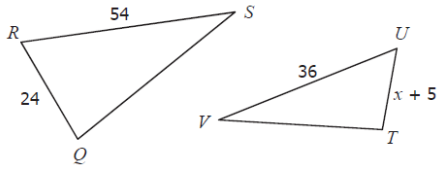
    a) x = _____

    b) y = _____



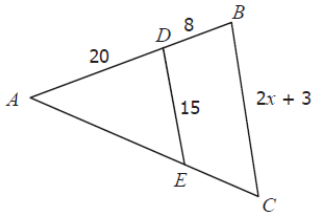
13. $\Delta QRS \sim \Delta TUV$

a) $x =$ _____



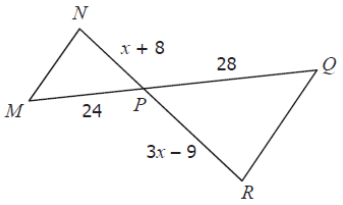
14. $\Delta ABC \sim \Delta ADE$

a) $x =$ _____



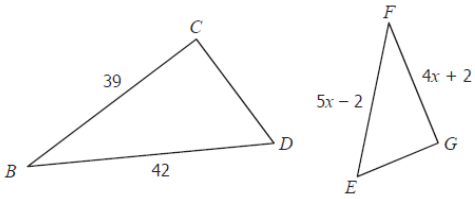
15. $\Delta MNP \sim \Delta QRP$

a) $x =$ _____



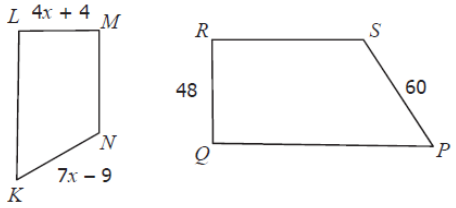
16. $\Delta BCD \sim \Delta FGE$

a) $x =$ _____



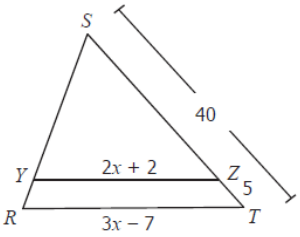
17. $\Delta KLMN \sim \Delta PQRS$

a) $x =$ _____



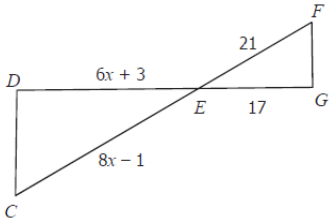
18. $\Delta RST \sim \Delta YSZ$

a) $x =$ _____



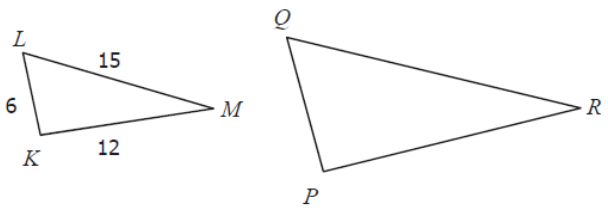
19. $\Delta CDE \sim \Delta FGE$

a) $x =$ _____



20. If $\Delta KLM \sim \Delta PQR$ with a scale factor of 3: 5, find the perimeter of ΔPQR

a) perimeter $\Delta PQR =$ _____

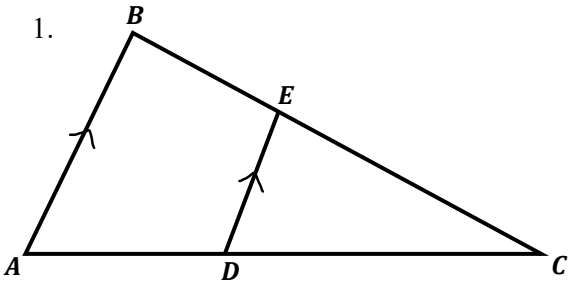


Math 2 Unit 6 Worksheet 2 **Name:**_____
Proving Triangles Similar **Date:**_____ **Per:**_____

[1-6] Determine if the triangles are similar.

a) Complete the statement of similarity. b) State the postulate or theorem that justifies the similarity. If not similar, write 'not similar' for both 'a' and 'b' and explain.

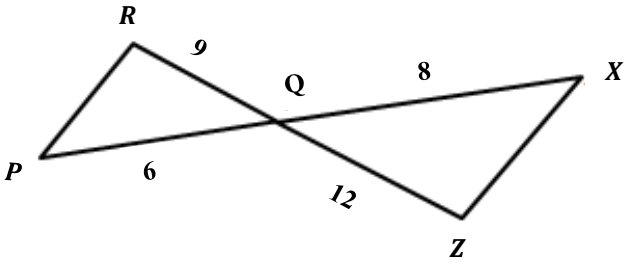
1.



a) $\Delta ABC \sim \Delta$ _____

b) _____

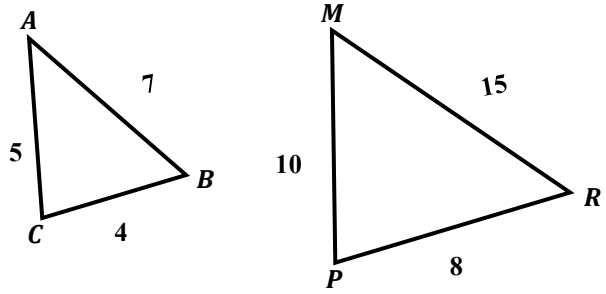
2.



a) $\Delta PQR \sim \Delta$ _____

b) _____

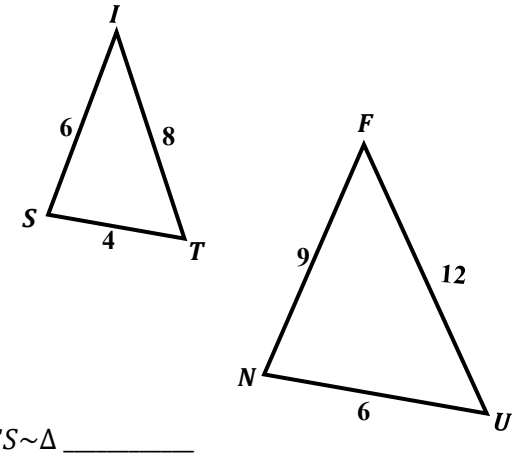
3.



a) $\Delta ABC \sim \Delta$ _____

b) _____

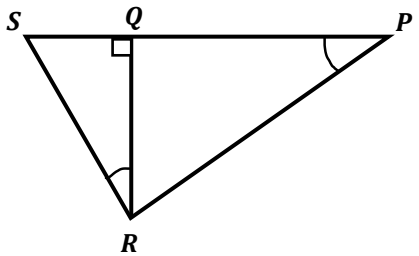
4.



a) $\Delta ITS \sim \Delta$ _____

b) _____

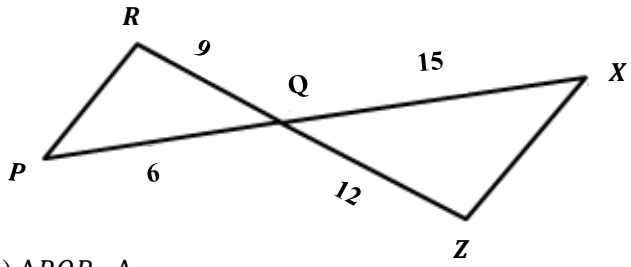
5.



a) $\Delta PQR \sim \Delta$ _____

b) _____

6.



a) $\Delta PQR \sim \Delta$ _____

b) _____

7. A 6 ft tall man is standing next to a tree. The man's shadow is 4 ft long. At the same time, the shadow of the tree is 10 ft long. How tall is the tree?

8. A 1.4 m tall child is standing next to a flagpole. The child's shadow is 1.2 m long. At the same time, the shadow of the flagpole is 7.5 m long. How tall is the flagpole?

9. Victoria wants to find the height of a flagpole. Victoria is 5 ft tall, the flagpole's shadow is 70 ft long, and her shadow is 12 ft long. Find the height of the flagpole.

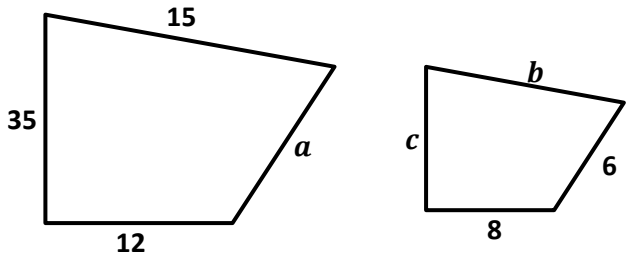
10. REVIEW: The quadrilaterals shown are similar. Find the scale factor of the larger quadrilateral to the smaller, then find the values of a, b, and c.

    a) the scale factor _____

    b) $a =$ _____

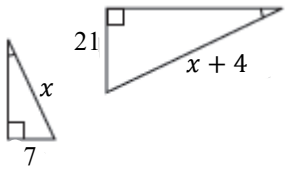
    c) $b =$ _____

    d) $c =$ _____

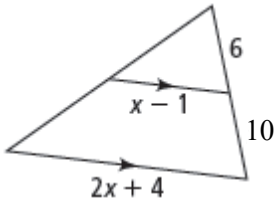


[11-14] Explain why the triangles are similar. Then find the value of x.

11.



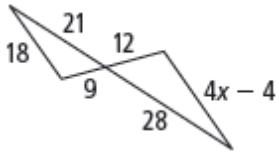
12.

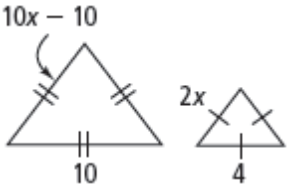


_____ _____

_____ _____

$x =$ _____ $x =$ _____

13. 

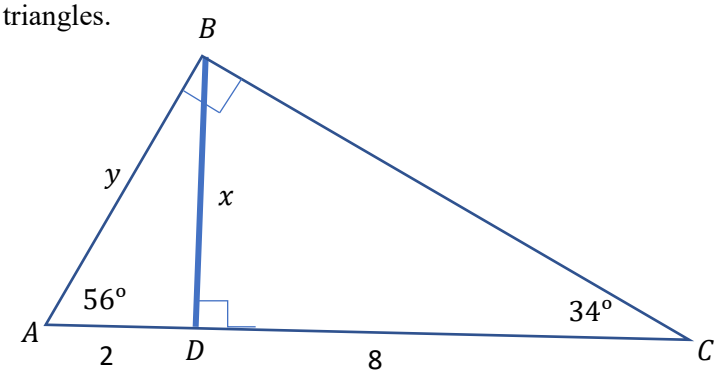
14. 

_____ _____

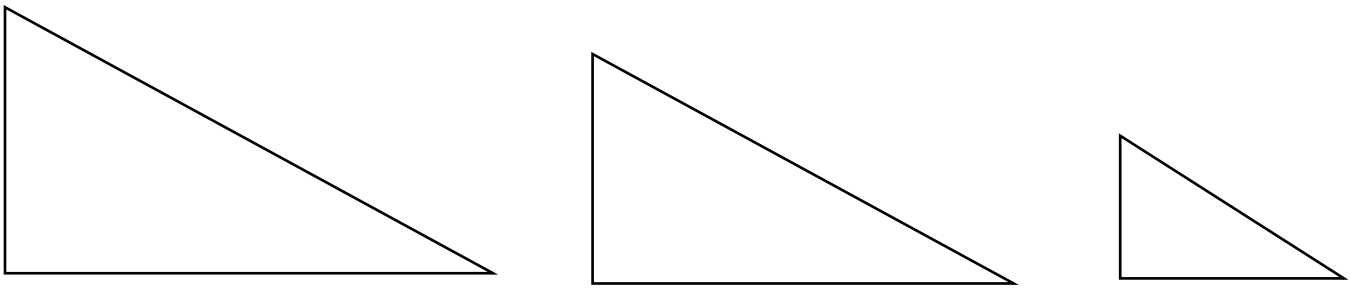
_____ _____

$x =$ _____ $x =$ _____

15. The below figure contains 3 similar triangles.



a) Label these three triangles with correct vertices, side lengths, and angle measures using the information in the original figure.



b) Using 2 to 4 complete sentences explain in detail how you know the largest and middle-sized triangles must be similar.

[c-d] Round answer to nearest tenth.

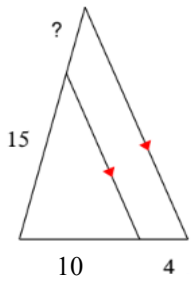
c) $x =$ _____ d) $y =$ _____

Math 2 Unit 6 Worksheet 3
Proportions in Triangles

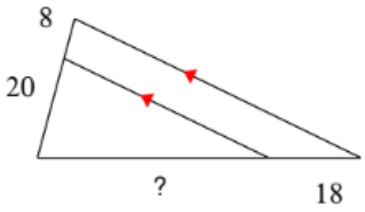
Name:_____
Date:_____ **Per:**_____

[1-10] Find the missing length.

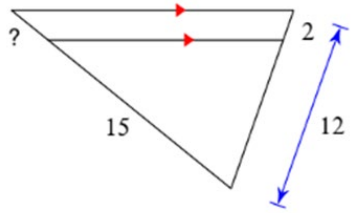
1. ? = _____



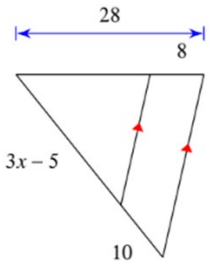
2. ? = _____



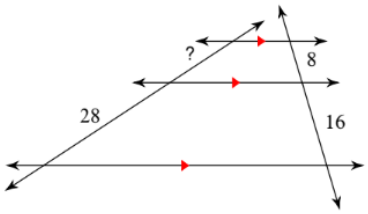
3. ? = _____



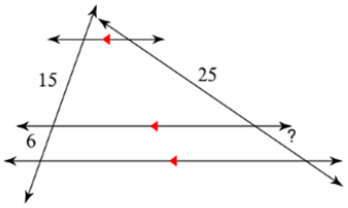
4. x = _____



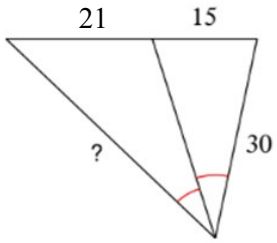
5. ? = _____



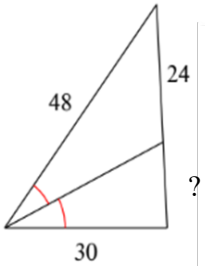
6. ? = _____



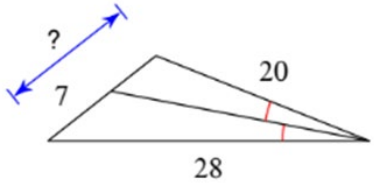
7. ? = _____



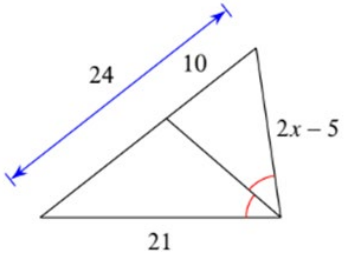
8. ? = _____



9. ? = _____

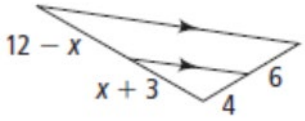


10. x = _____

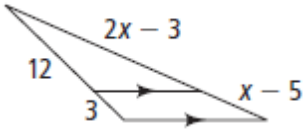


[11-14] Solve for x.

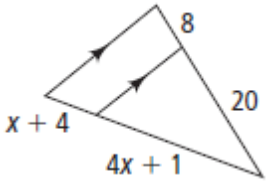
11. x = _____



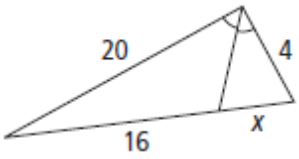
12. x = _____



13. x = _____



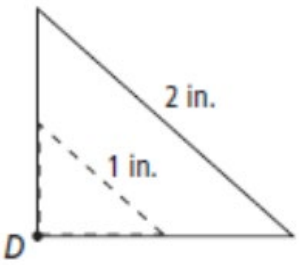
14. x = _____



Math 2 Unit 6 Worksheet 4
Dilations

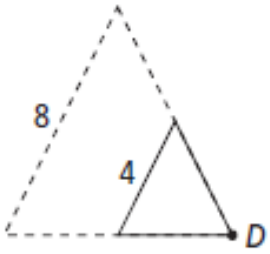
Name:_____
Date:_____ **Per:**_____

[1-5] The dashed-line figure is a dilation image of the solid-line figure. The labeled point is the center of dilation. Tell whether the dilation is: a) an enlargement or a reduction and b) find the scale factor of the dilation.

1. 

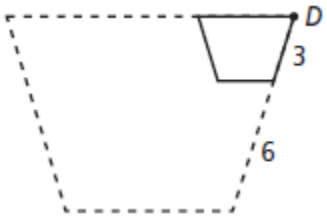
a) _____

b) scale factor _____

2. 

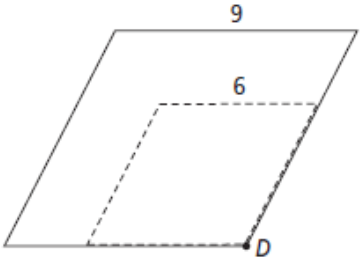
a) _____

b) scale factor _____

3. 

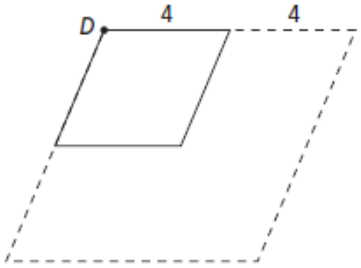
a) _____

b) scale factor _____

4. 

a) _____

b) scale factor _____

5. 

a) _____

b) scale factor _____

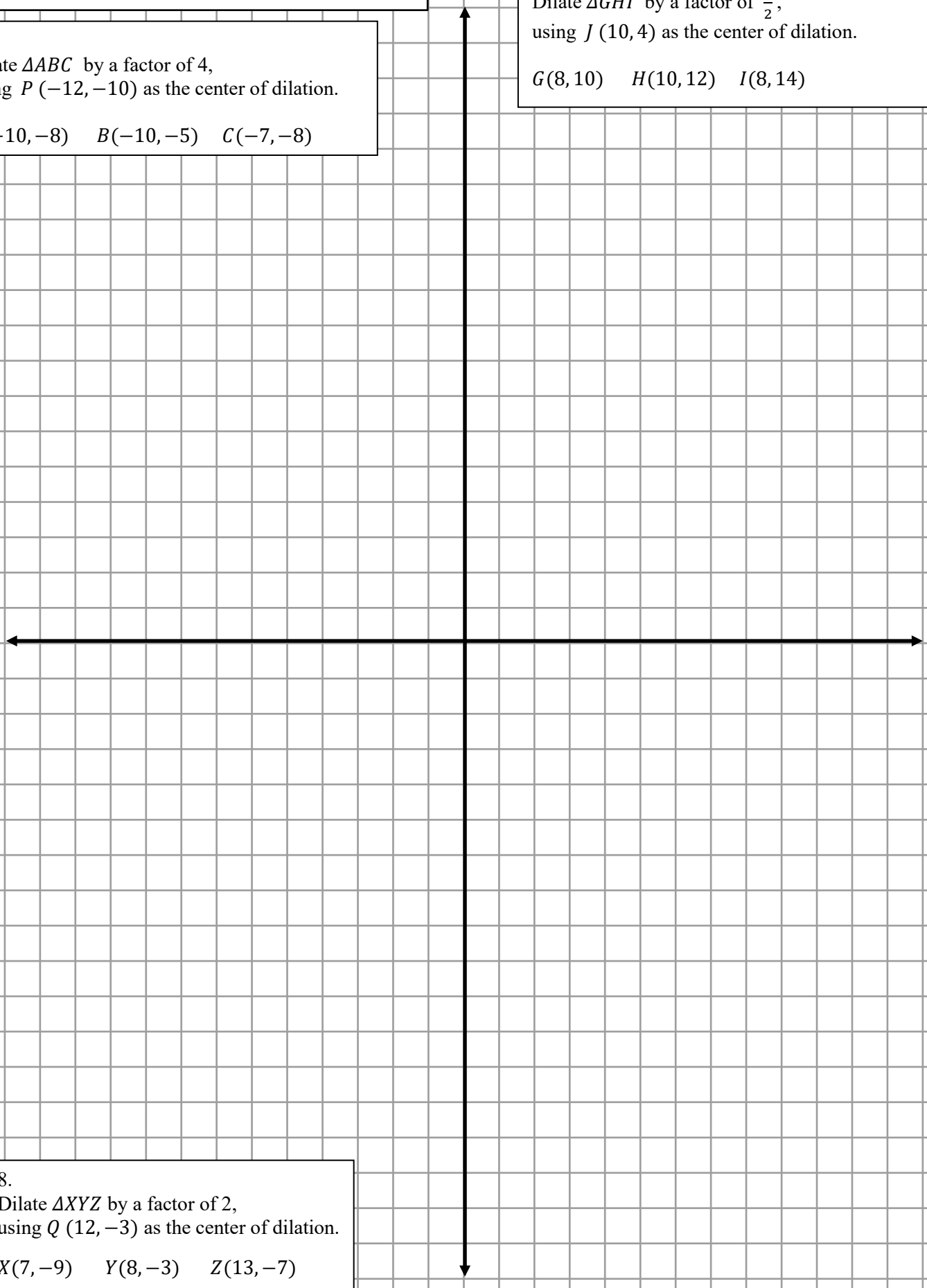
Dilation - When the Center of Dilation is Not the Origin
https://youtu.be/4Yap2t_v034

6.
Dilate ΔABC by a factor of 4,
using $P\ (-12,-10)$ as the center of dilation.

$A(-10,-8)$ $B(-10,-5)$ $C(-7,-8)$

7.
Dilate ΔGHI by a factor of $\frac{1}{2}$,
using $J\ (10,4)$ as the center of dilation.

$G(8,10)$ $H(10,12)$ $I(8,14)$

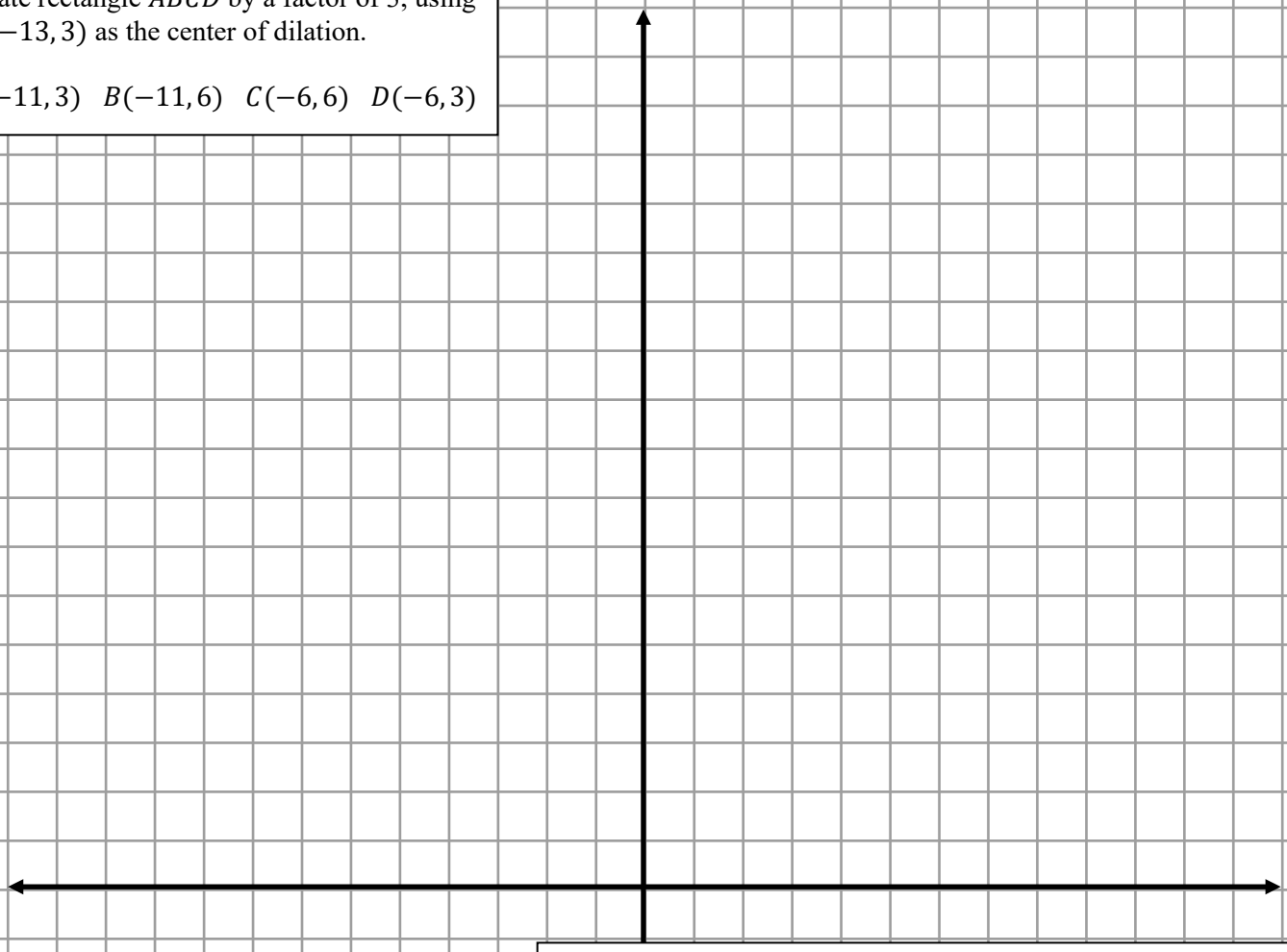


8.
Dilate ΔXYZ by a factor of 2,
using $Q\ (12,-3)$ as the center of dilation.

$X(7,-9)$ $Y(8,-3)$ $Z(13,-7)$

9.
Dilate rectangle $ABCD$ by a factor of 3, using $P\ (-13, 3)$ as the center of dilation.

$A(-11, 3)$ $B(-11, 6)$ $C(-6, 6)$ $D(-6, 3)$



10.
Find the perimeter and area of each rectangle from problem 9.

$ABCD$ $P = \_\_\_\_\_, A = \_\_\_\_\_$

$A'B'C'D'$ $P = \_\_\_\_\_, A = \_\_\_\_\_$

What is the scale factor of $ABCD$ to $A'B'C'D'$? _____

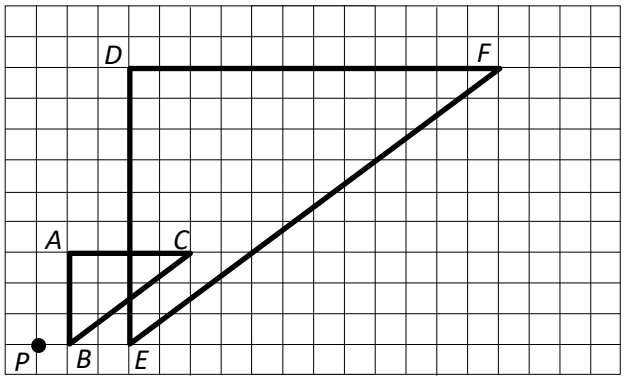
What is the ratio of the perimeters? _____

What is the ratio of the areas? _____

If the ratio of two similar figures is *a* to *b*, then

- **The ratio of any length is _____**
- **The ratio of the perimeter is _____**
- **The ratio of the area is _____**

11. ΔDEF is a dilation of ΔABC with a center of point P.



a) Is the dilation an enlargement or reduction? _____

b) What is the scale factor? _____

c) Perimeter of ΔABC_____ Area of ΔABC_____

Perimeter of ΔDEF_____ Area of ΔDEF_____

d) What is the relationship between the perimeters of similar figures?

_____

e) What is the relationship between the areas of similar figures?

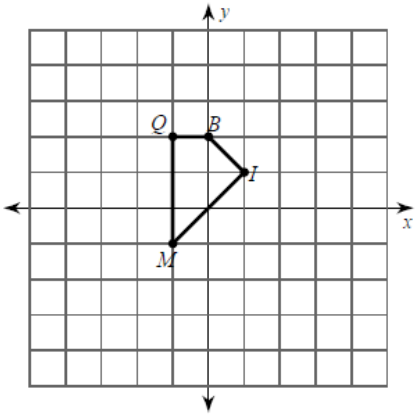
_____

Math 2 Unit 6 Worksheet 5
Dilations Centered at (0,0)

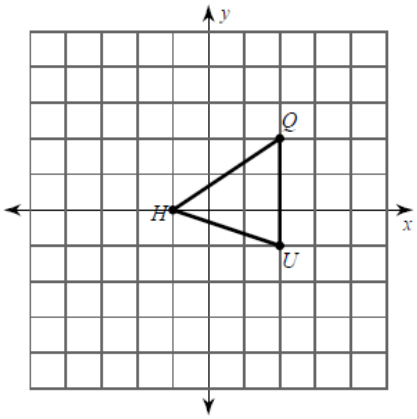
Name:_____
Date:_____ **Per:**_____

[1-4] Determine if the dilation is a reduction or enlargement of the figure using (0,0) as the center of dilation. Graph the image of the figure using the dilation given.

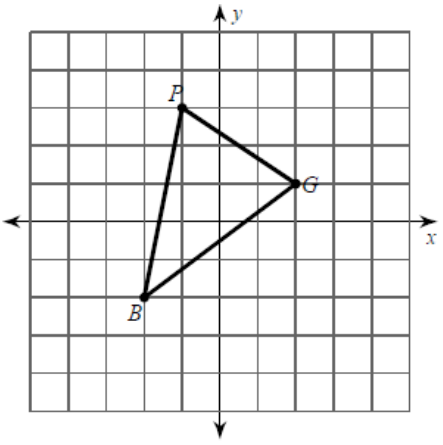
1. Dilation of 2: _____



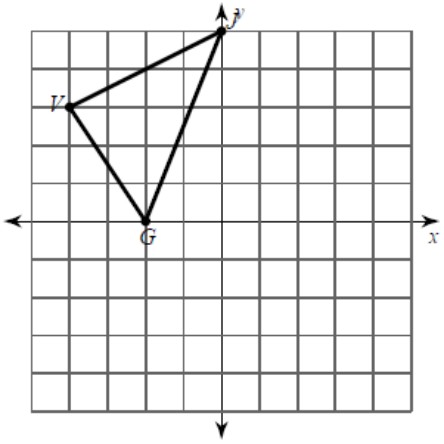
2. Dilation of 0.5: _____



3. Dilation of $\frac{3}{2}$: _____

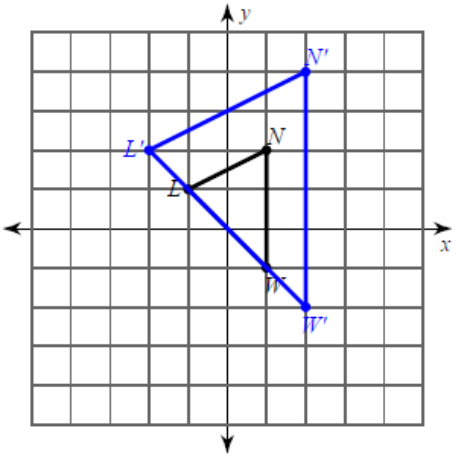


4. Dilation of $\frac{1}{2}$: _____

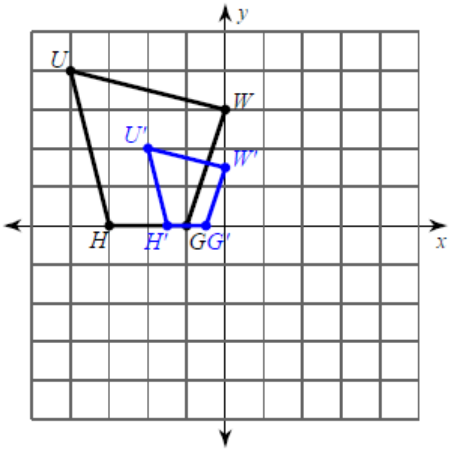


[5-7] Write a rule to describe each dilation.

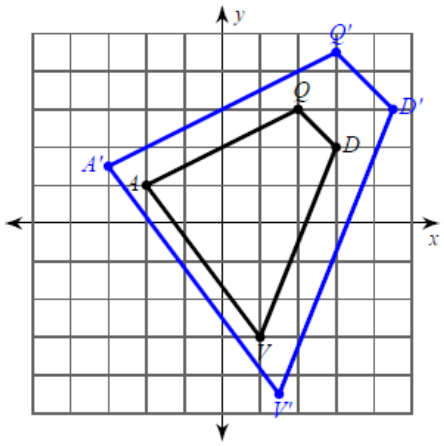
Example
Rule: $(x\ ,\ y) \rightarrow (2x\ ,\ 2y)$



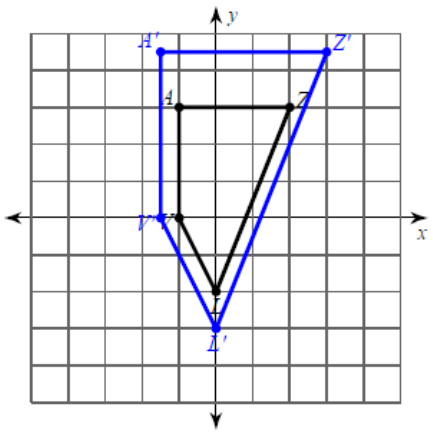
5. Rule: (____, ____) → (____, ____)



6. Rule: (____ , ____) → (____ , ____)



7. Rule: (____ , ____) → (____ , ____)



[8-12] Determine if the scale factor will reduce or enlarge the figure. Find the coordinates of the vertices of each figure after the given dilation.

8. Dilation of 2: _____
$W\ (-2\ ,-1)$; $E\ (-2\ ,1)$; $J\ (2\ ,1)$; $X\ (2\ ,0)$

W'(____ , ____); E'(____ , ____); J'(____ , ____); X'(____ , ____)

9. Dilation of $\frac{3}{2}$: _____
$E\ (-2\ ,0)$; $K\ (1\ ,2)$; $Y\ (3\ ,-2)$

E'(____ , ____); K'(____ , ____); Y'(____ , ____)

10. Dilation of $\frac{5}{2}$: _____
$F\ (-1\ ,1)$; $Z\ (2\ ,2)$; $E\ (0\ ,-1)$

F'(____ , ____); Z'(____ , ____); E'(____ , ____)

11. Dilation of $\frac{1}{2}$: _____
$N\ (-1\ ,-3)$; $C\ (0\ ,-2)$; $I\ (3\ ,-5)$

N'(____ , ____); C'(____ , ____); I'(____ , ____)

[12-14] Write a rule to describe each dilation.

Example: $G\ (2\ ,-4)$; $A\ (1\ ,-1)$; $L\ (2\ ,-1)$; $T\ (3\ ,-4)$
$G'\ (0.5\ ,-1)$; $A'\ (0.25\ ,-0.25)$; $L'\ (0.5\ ,-0.25)$; $T'\ (0.75\ ,-1)$ Rule: $(\ x\ ,\ y\ ) \rightarrow (\frac{1}{4}x\ ,\ \frac{1}{4}y)$

12. $S\ (-4\ ,-1)$; $A\ (-3\ ,4)$; $X\ (0\ ,1)$
$S'\ (-12\ ,-3)$; $A'\ (-9\ ,12)$; $X'\ (0\ ,3)$ Rule: (x , y) → (____ , ____)

13. $H\ (-2\ ,0)$; $Y\ (-1\ ,4)$; $B\ (3\ ,1)$
$H'\ (-0.5\ ,\ 0)$; $Y'\ (-0.25\ ,1)$; $B'\ (0.75\ ,0.25)$ Rule: (x , y) → (____ , ____)

14. $U\ (-4\ ,-5)$; $Y\ (-5\ ,-1)$; $P\ (-4\ ,-1)$; $K\ (-3\ ,-3)$
$U'\ (-2\ ,-2.5)$; $Y'\ (-2.5\ ,-0.5)$; $P'\ (-2\ ,-0.5)$; $K'\ (-1.5\ ,-1.5)$ Rule: (x , y) → (____ , ____)

Math 2 Unit 6
Review Worksheet

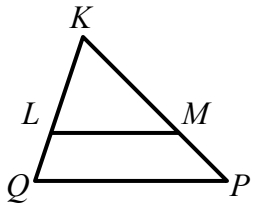
Name:_____
Date:_____ **Per:**_____

[1-9] Select the correct multiple choice response. Show all work.

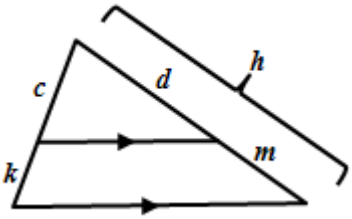
1. Solve the proportion: $\frac{8}{14} = \frac{x}{35}$
   a. 24
   b. 21
   c. 25
   d. 20

2. Solve the proportion: $\frac{3}{5} = \frac{x+10}{45}$
   a. 9
   b. 17
   c. 25
   d. 27

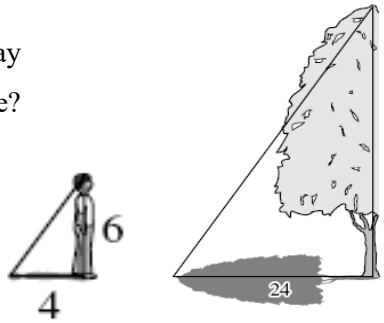
3. Given: $\Delta KLM \sim \Delta KQP$
   Which side below makes the proportion $\frac{KQ}{KL} = \frac{?}{KM}$ true?
   a. KP
   b. KM
   c. LM
   d. QP



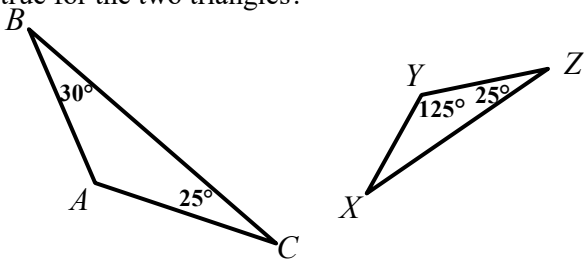
4. Which proportion is accurate for the diagram shown?
   a. $\frac{d}{h} = \frac{c}{k}$
   b. $\frac{d}{h} = \frac{k}{c}$
   c. $\frac{d}{h} = \frac{c}{c+k}$
   d. $\frac{d}{h} = \frac{c}{c-k}$



5. A 6-foot boy has a shadow that is 4 feet. At the same time of day a tree has a shadow that is 24 feet. What is the height of the tree?
   a. 12 ft.
   b. 18 ft.
   c. 24 ft.
   d. 36 ft.



6. Which similarity statement below is true for the two triangles?
   a. ΔBCA ~ΔXZY
   b. ΔABC ~ΔZXY
   c. ΔBAC ~ΔZXY
   d. ΔABC ~ΔYZX



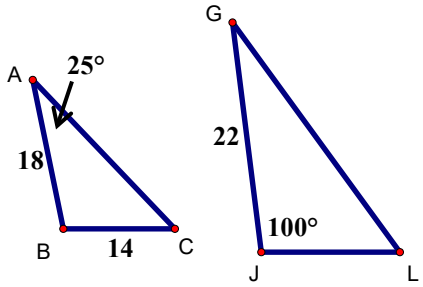
7. $\Delta A'B'C'$ is the image of ΔABC under a dilation with a scale factor of 2.5 centered at the origin. If $AB = 8$ units, what is the unit length of $\overline{A'B'}$?
   a. 20
   b. 16
   c. 4
   d. 2.5

8. Using the diagram below, $\Delta ABC \sim \Delta GJL$

a) $m\angle B =$ _____

b) $m\angle L =$ _____

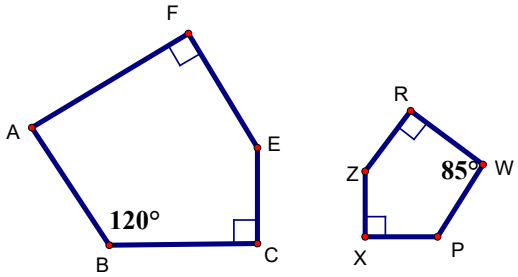
c) Find the scale factor of the smaller triangle to the larger _____



9. Using the diagram below, $ABCEF \sim WPXZR$

a) $m\angle A =$ _____

b) $m\angle P =$ _____

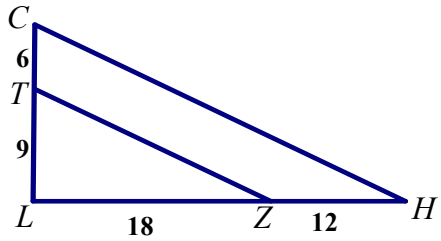


[10-14] Determine if the triangles are similar.

a) Complete the statement of similarity. b) State the postulate or theorem that justifies the similarity.
If not similar, write 'not similar' for both 'a' and 'b' and explain.

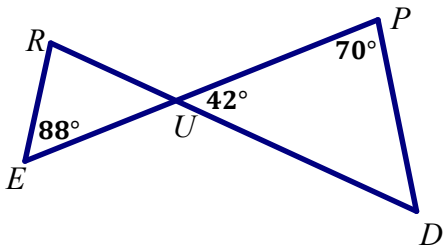
10. a) $\Delta TLZ \sim \Delta$ _____

b) _____



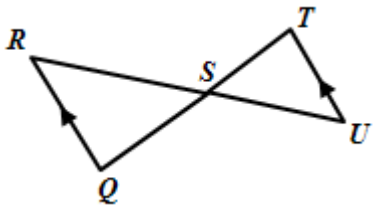
11. a) $\Delta URE \sim \Delta$ _____

b) _____



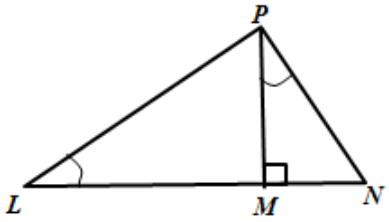
12. a) $\Delta RQS \sim \Delta$ _____

b) _____



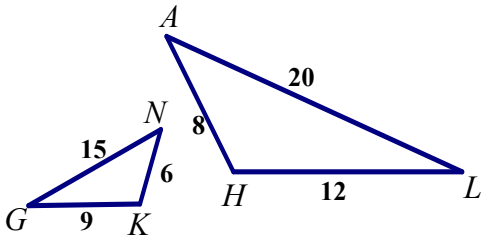
13. a) $\Delta LMP \sim \Delta$ _____

b) _____



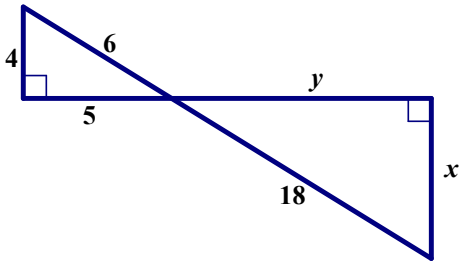
14. a) $\Delta KGN \sim \Delta$ _____

b) _____

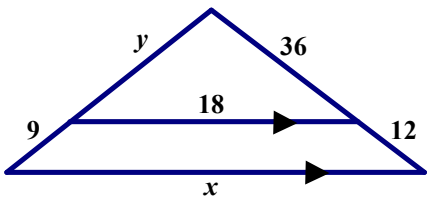


[15-18] The following figures are similar. Find the values of the variable(s).

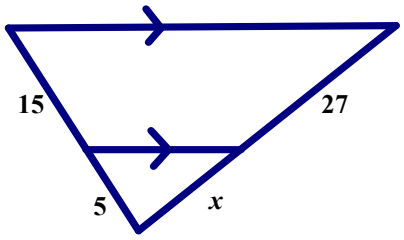
15. $x =$ _____ $y =$ _____



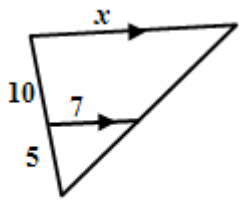
16. $x =$ _____ $y =$ _____



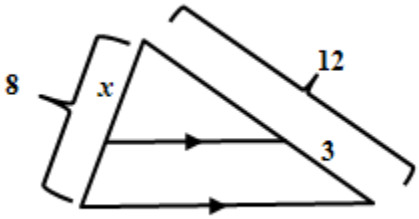
17. $x =$ _____



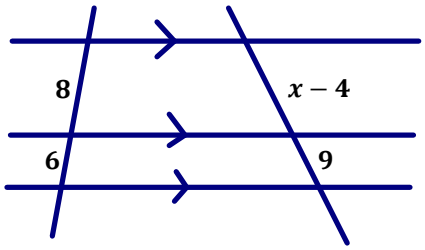
18. $x =$ _____



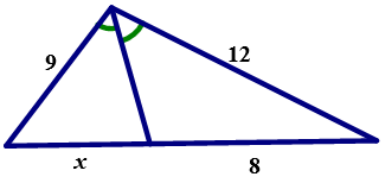
19. $x =$ _____



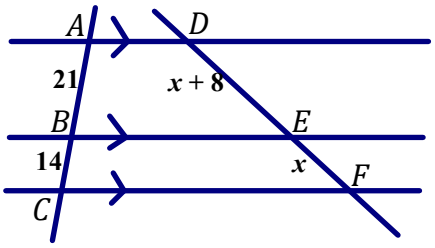
20. $x =$ _____



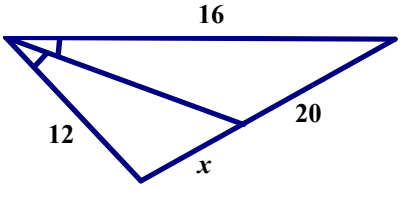
21. $x =$ _____



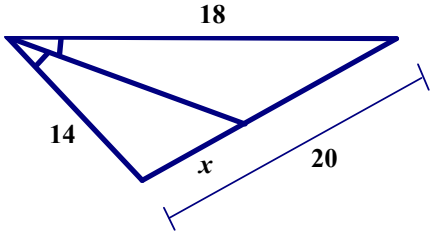
22. $x =$ _____ $DF =$ _____



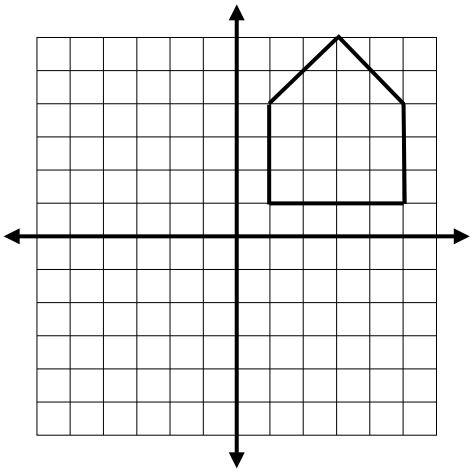
23. $x =$ _____



24. $x =$ _____

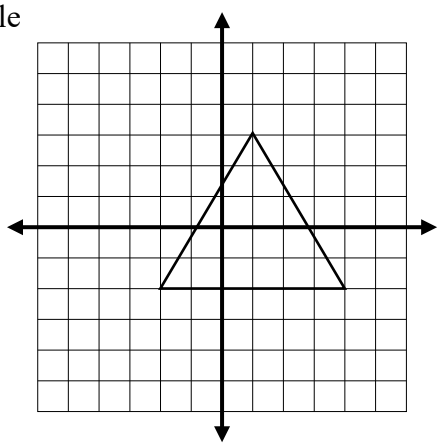


25. A student dilates the figure at the right using a center of dilation of (0, 0) and a scale factor of 2. Which statement is true?



a) Each angle of the dilated house will be similar but not congruent in the original house.
b) Each line segment in the dilated house will be parallel to its corresponding line segment in the original house.
c) Some of the line segments of the dilated house may have different slopes than their corresponding line segments in the original house
d) The distance between the vertices of a line segment on the dilated house will be 4 times the distance between the vertices of a line segment on the original house.

26. For the triangle at the right,



a) Graph the figure representing a dilation of the triangle by a scale factor of 1.5 with the center at (0, 0).

b) Should the two triangles be similar? _____

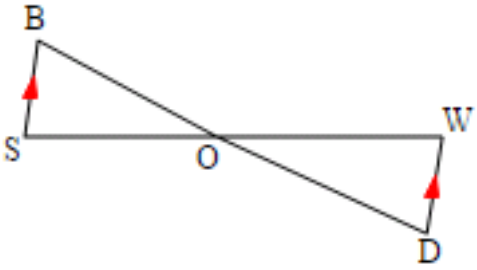
c) Should the corresponding sides be parallel? _____

d) Should the corresponding sides be congruent? _____

e) Should the corresponding angles be congruent? _____

27. Make a two-column proof.

Given: $\overline{BS} \parallel \overline{WD}$
Prove: $\Delta BSO \sim \Delta DWO$



Statement	Reason