

Similar Figures Worksheet
Show All Work Where Necessary!

Name KEY

You can use proportional relationships to find missing side lengths in similar figures

Solve each proportion.

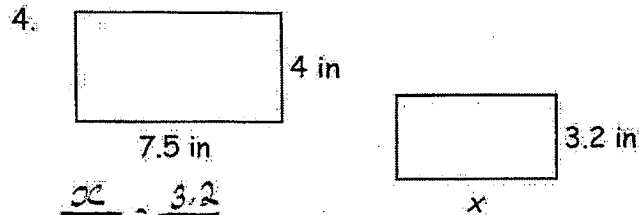
1. $\frac{3}{8} = \frac{x}{24}$
 $\frac{8x}{8} = \frac{72}{8}$

$x = 9$

2. $\frac{5}{7} = \frac{25}{y}$
 $5y = 175$
 $y = 35$

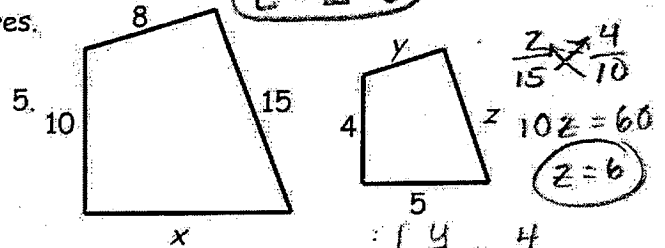
3. $\frac{5}{t} = \frac{t}{45}$
 $t^2 = 225$
 $t = \pm 15$

Find the indicated length for each pair of similar figures.



$\frac{x}{7.5} = \frac{3.2}{4}$
 $4x = 24$

$x = 6$

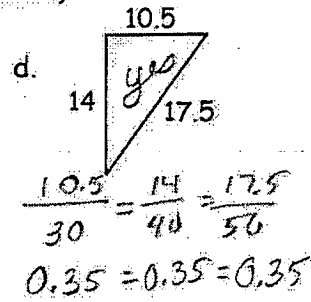
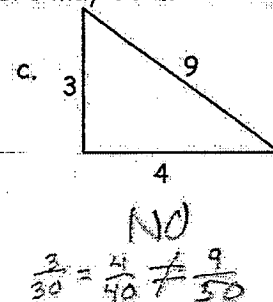
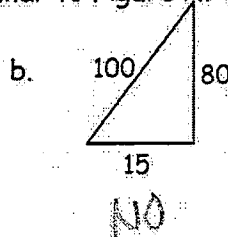
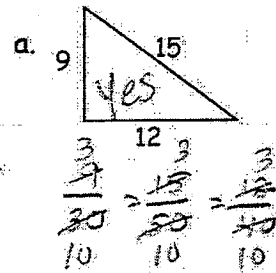
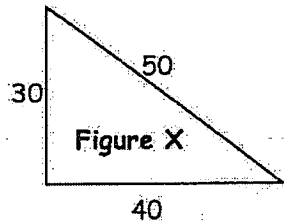


$\frac{x}{5} = \frac{16}{4}$
 $4x = 50$

$x = 12.5$

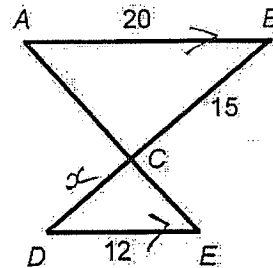
$\frac{z}{15} = \frac{4}{10}$
 $10z = 60$
 $z = 6$

6. Which of the following figures are similar to Figure X? (there may be more than one)



7. In the diagram below, \overline{AB} is parallel to \overline{DE} . $AB = 20$ inches, $DE = 12$ inches, and $BC = 15$ inches. What is the length of \overline{DC} ?

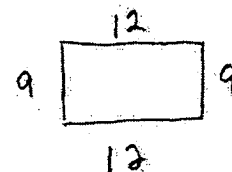
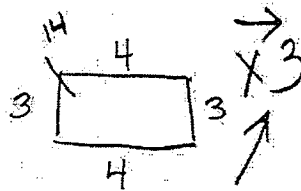
- A. 25 in.
- B. 9 in.**
- C. 7 in.
- D. 90 in.



$\frac{x}{15} = \frac{12}{20}$
 $20x = 180$
 $x = 9$

8. A rectangle has a length of 4 feet and a perimeter of 14 feet. What is the perimeter of a similar rectangle with a width of 9 feet?

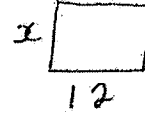
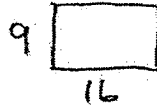
- A. 36 ft
- B. 108 ft
- C. 42 ft**
- D. 126 ft



Scale factor

9. Brandon wants to reduce a figure that is 9 inches tall and 16 inches wide so that it will fit on a 9-inch-by-12-inch piece of paper. If he reduces the figure proportionally, what is the maximum size the reduced figure could measure?

- A. 12 inches by $21\frac{1}{3}$ inches
- B. 9 inches by 12 inches
- C. $5\frac{1}{16}$ inches by 9 inches
- D. $6\frac{3}{4}$ inches by 12 inches**



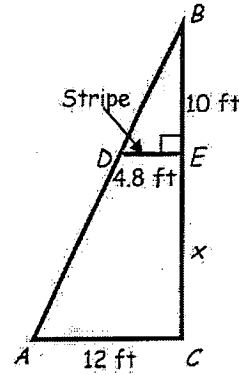
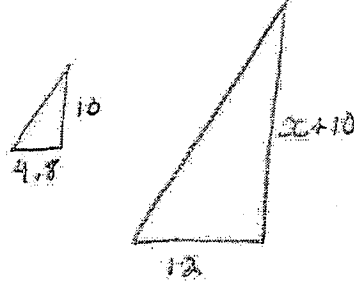
$$\frac{x}{9} = \frac{12}{16}$$

$$16x = 108$$

$$x = 6.75$$

10. The sail shown below has a horizontal stripe parallel to the base of the sail. What is the distance, x , from the bottom of the sail to the stripe?

- A. 25 feet
- B. 15 feet**
- C. 5.8 feet
- D. 4 feet



$$\frac{x+10}{10} = \frac{12}{4.8}$$

$$4.8(x+10) = 120$$

$$4.8x + 48 = 120$$

$$-48 \quad -48$$

$$4.8x = 72$$

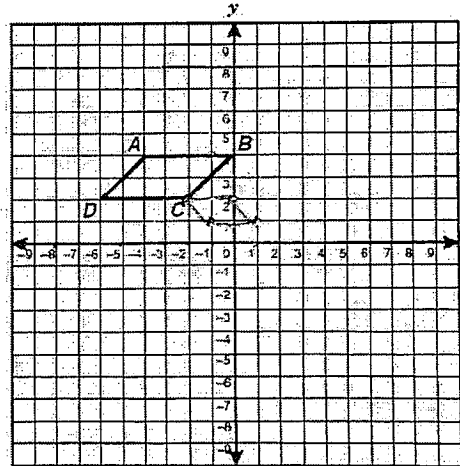
$$x = 15$$

11. The graph of parallelogram $ABCD$ is shown below.

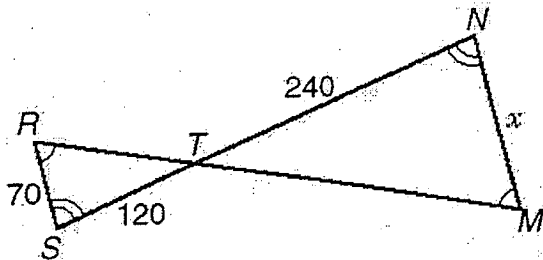
Which set of coordinates identifies the vertices of a parallelogram that is similar to $ABCD$?

$(-6, 2) (-2, 2) (-4, 4) (0, 4)$

- A. $(0, 2), (2, 2), (1, 1), (-1, 1)$**
- B. $(-2, 2), (0, 2), (1, 0), (-1, 0)$
- C. $(-8, 8), (-3, 8), (-5, 4), (-10, 4)$
- D. $(-3, 1), (1, 1), (-1, 5), (-5, 5)$



12. If triangle TSR is similar to triangle TNM , what is the length of x ?



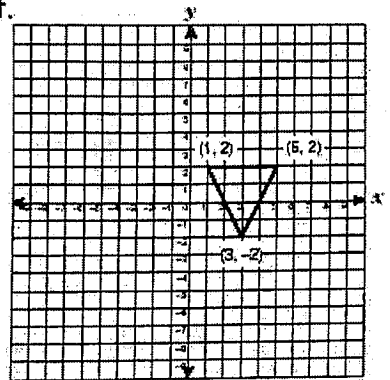
$$\frac{x}{70} = \frac{240}{120}$$

$$120x = 16800$$

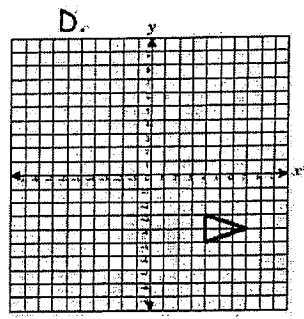
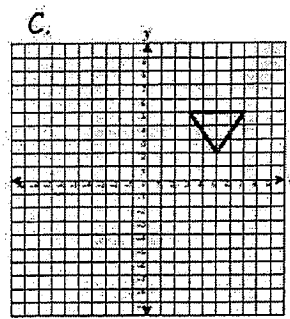
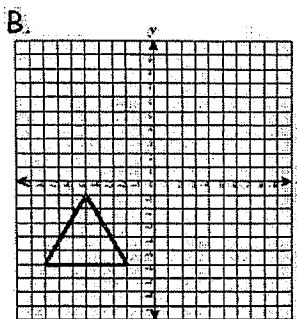
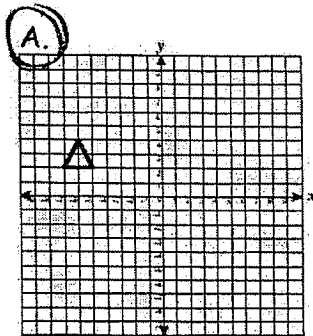
$$\frac{120x}{120} = \frac{16800}{120}$$

$$x = 140$$

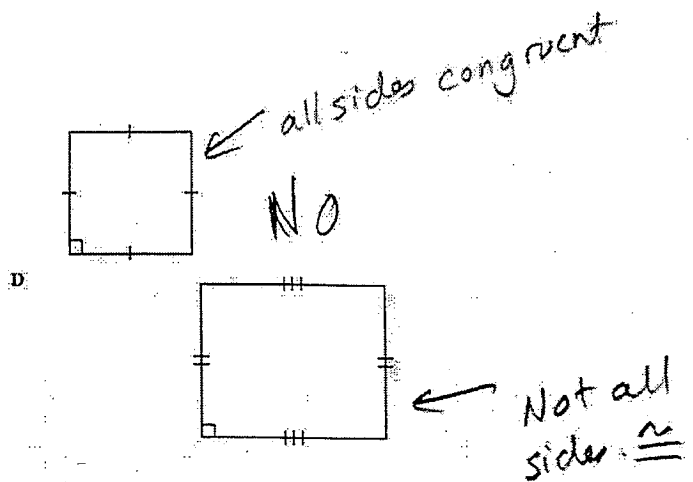
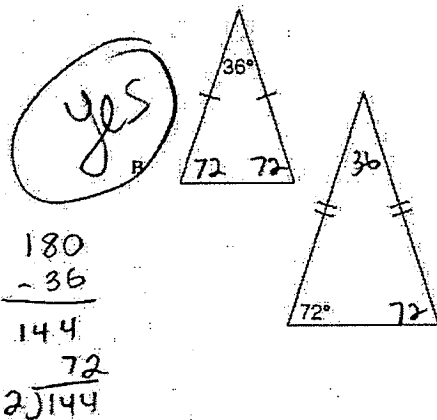
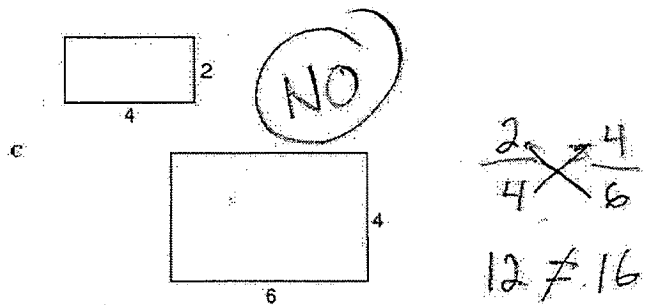
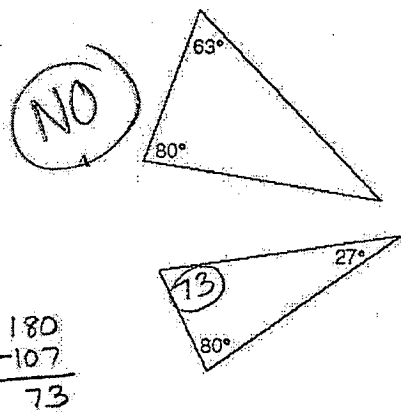
13. A triangle with vertices (1, 2), (5, 2), and (3, -2) is shown to the right.



Which triangle below is similar to the figure above?



14. Use the information in each diagram to determine which pairs of polygons are similar.



15. A certain parallelogram has the dimensions shown.
Which set of dimensions would produce a similar figure?

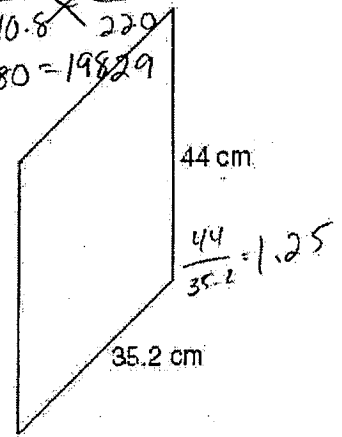
- A. ^{yes} 17.6 cm, 88 cm
 B. NO 70.4 cm, 176 cm
 C. ^{yes} 105.6 cm, 132 cm
 D. NO 140.8 cm, 220 cm

A. ^{yes}
 $\frac{17.6}{35.2} = \frac{44}{88}$
 $1548.8 = 1548.8$

B. NO
 $\frac{44}{70.4} \neq \frac{35.2}{176}$
 $0.625 \neq 0.2$

C. ^{yes}
 $\frac{44}{105.6} = \frac{35.2}{132}$
 $5808 = 5808$

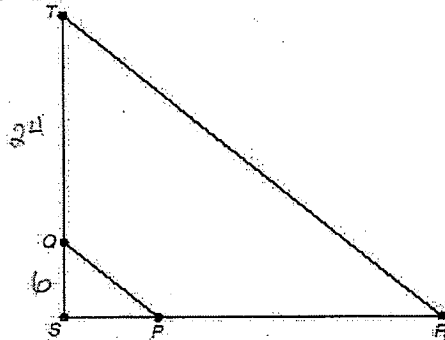
D. ~~$\frac{44}{140.8} = \frac{35.2}{220}$~~
 ~~$9680 = 19829$~~



16. In triangle STR, \overline{QP} and \overline{TR} are parallel.

If SQ = 6 units, QT = 24 units, and the perimeter of triangle SQP is 20 units, what is the perimeter of triangle STR?

- A. 80 units
 B. 100 units
 C. 320 units
 D. 500 units



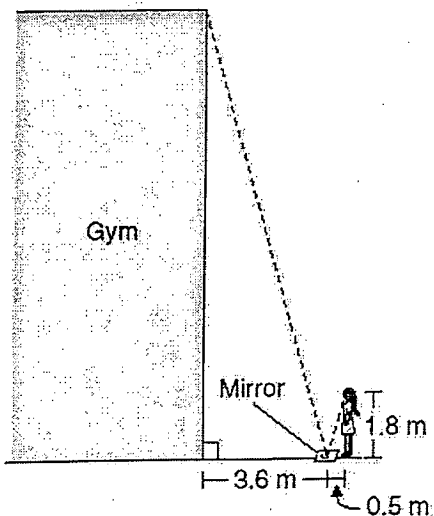
$$\frac{6}{30} = \frac{20}{x}$$

$$6x = 600$$

$$x = 100$$

perimeter SQP = 20

17. To estimate the height of her school's gym, Nicole sights the top of the gym wall in a mirror that she has placed on the ground. The mirror is 3.6 meters from the base of the gym wall. Nicole is standing 0.5 meter from the mirror, and her height is about 1.8 meters. What is the height of the gym wall?



$$\frac{0.5}{3.6} = \frac{1.8}{x}$$

$$0.5x = 6.48$$

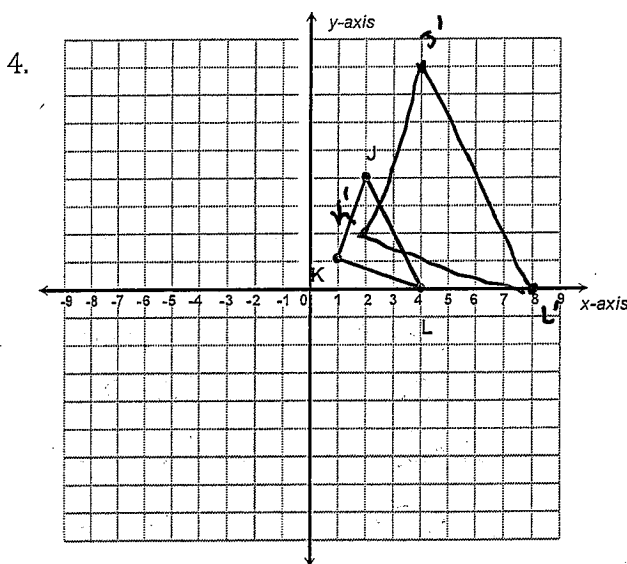
$$x = 12.96 \text{ meters}$$

Name: _____ Date: _____

Dilations/Translations Worksheet

Directions: Answer the following questions to the best of your ability. For the y-axis, use the same scaling as the x-axis

1. In Math, the word dilate means to Reduce or Enlarge a figure.
2. If a scale factor is less than 1, then your figure gets Reduced (smaller).
3. If a scale factor is greater than 1, then your figure gets Enlarged (larger).

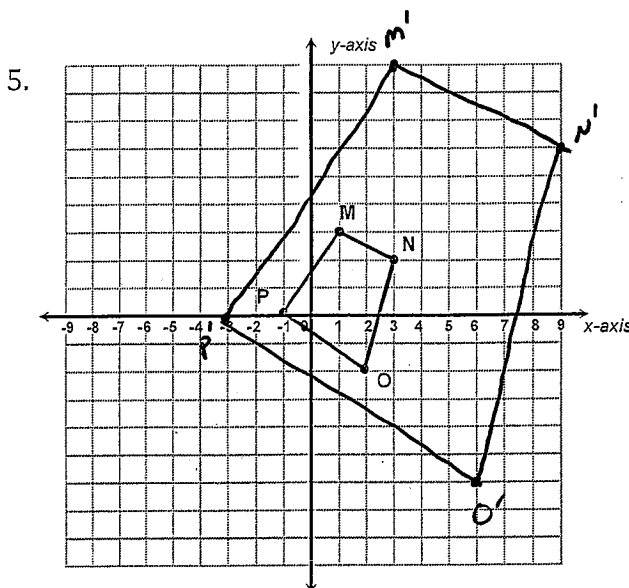


Graph the dilated image of triangle JKL using a scale factor of 2 and (0,0) as the center of dilation.

J: (2, 4) J': (4, 8)

K: (1, 1) K': (2, 2)

L: (4, 0) L': (8, 0)



Graph the dilated image of quadrilateral MNOP using a scale factor of 3 and the origin as the center of dilation.

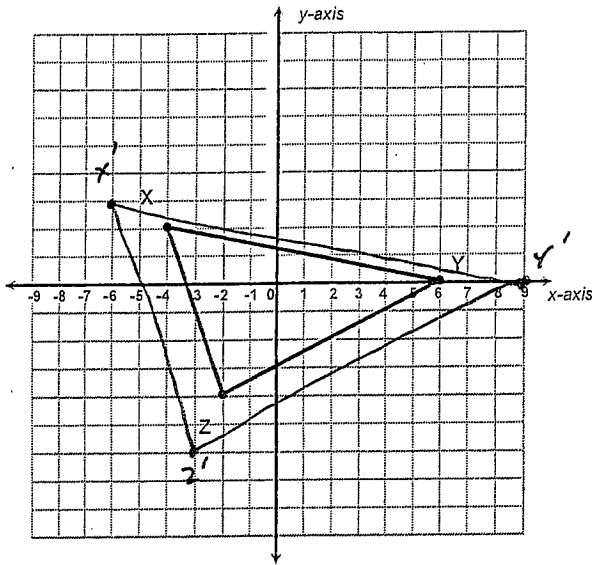
M: (1, 3) M': (3, 9)

N: (3, 2) N': (9, 6)

O: (2, -2) O': (6, -6)

P: (-1, 0) P': (-3, 0)

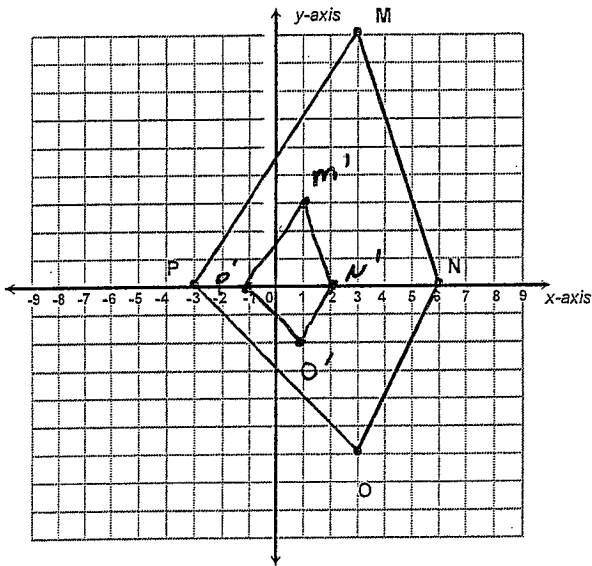
6.



Graph the dilated image of triangle XYZ using a scale factor of 1.5 and (0,0) as the center of dilation.

- X: (-4, 2) X': (-6, 3)
 Y: (6, 0) Y': (9, 0)
 Z: (-2, -4) Z': (-3, -6)

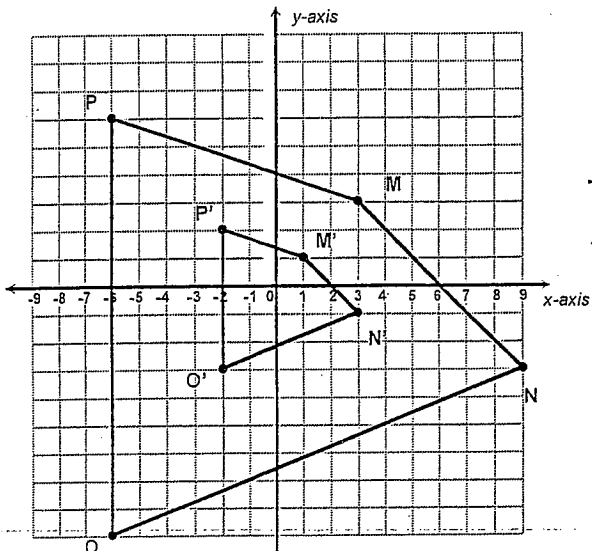
7.



Graph the dilated image of quadrilateral MNOP using a scale factor of 1/3 and the origin as the center of dilation.

- M: (3, 9) M': (1, 3)
 N: (6, 0) N': (2, 0)
 O: (3, -6) O': (1, -2)
 P: (-3, 0) P': (-1, 0)

8.



Describe the dilation of quadrilateral MNOP, using the origin as the center.

Reduction with scale factor of 1/3

- m(3, 3) m'(1, 1)
 n(9, 3) n'(3, -1)

Name: _____ Date: _____

9. The table below shows the coordinates of triangle RST and the coordinates of R' in triangle R'S'T'. Triangle R'S'T' is a dilation of triangle RST.

Triangle RST		Triangle R'S'T'	
R	$(-2, -3)$	R'	$(-6, -9)$
S	$(0, 2)$	S'	
T	$(2, -3)$	T'	

Part A

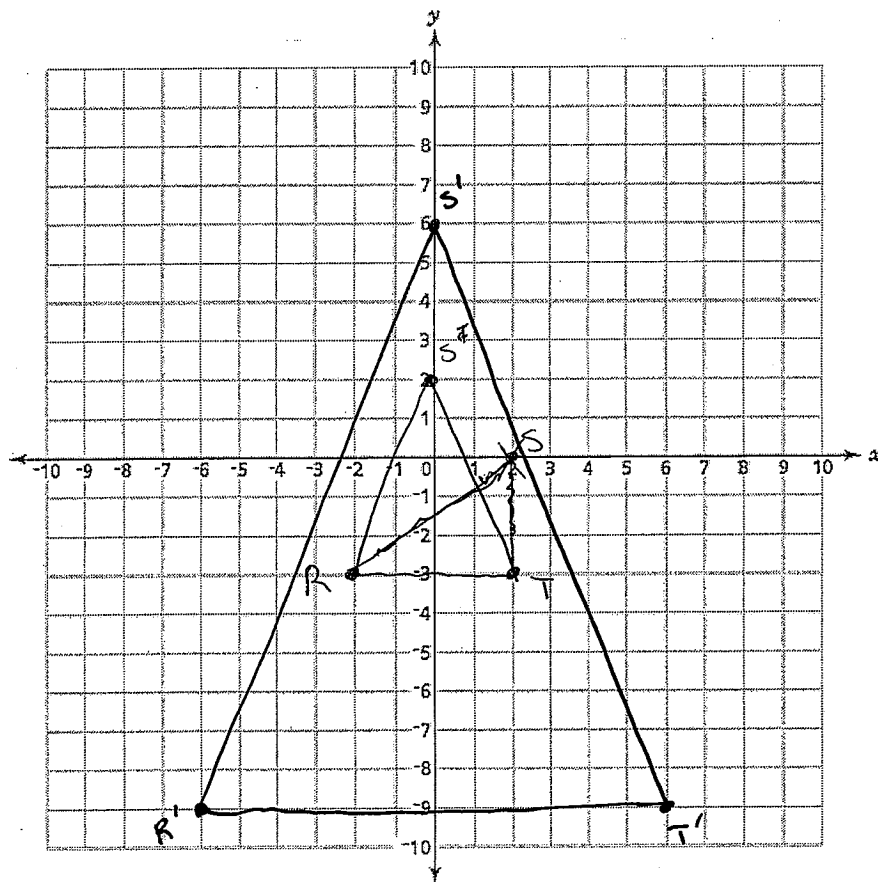
What are the coordinates of point S' and point T'?

Answer $S' = (0, 6)$

$T' = (6, -9)$

Part B

On the grid below, draw triangle RST and triangle R'S'T'.



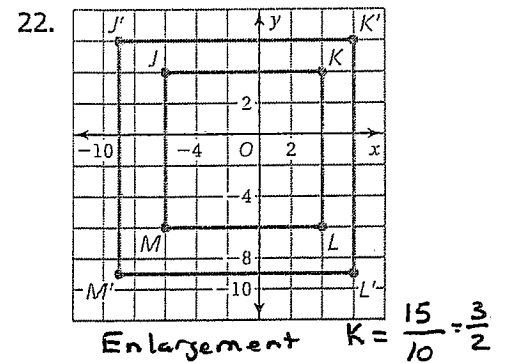
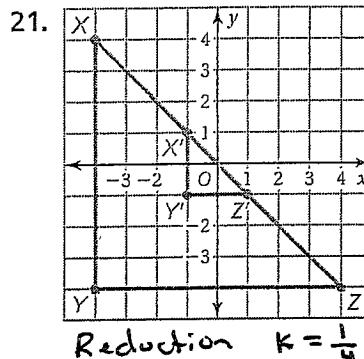
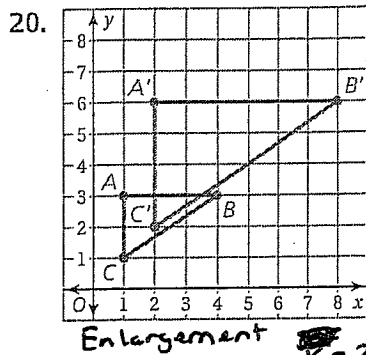
19. **ERROR ANALYSIS** Describe and correct the error in listing the coordinates of the image after a dilation with a scale factor of $\frac{1}{2}$.

~~X~~

Vertices of ABC	$(\frac{1}{2}x, \frac{1}{2}y)$ $(2x, 2y)$	Vertices of A'B'C'
A(2, 5)	$(2 \cdot 2, 2 \cdot 5)$	A'(4, 10)
B(2, 0)	$(2 \cdot 2, 2 \cdot 0)$	B'(4, 0)
C(4, 0)	$(2 \cdot 4, 2 \cdot 0)$	C'(8, 0)

$(1, 2.5)$
 $(1, 0)$
 $(2, 0)$

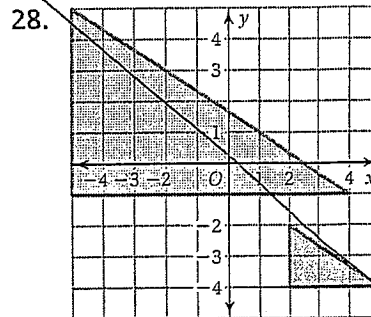
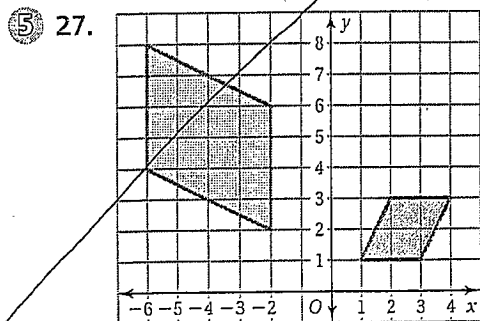
The blue figure is a dilation of the red figure. Identify the type of dilation and find the scale factor.



The vertices of a figure are given. Find the coordinates of the figure after the transformations given.

23. A(-5, 3), B(-2, 3), C(-2, 1), D(-5, 1)
Reflect in the y-axis. Then dilate with respect to the origin using a scale factor of 2.
24. F(-9, -9), G(-3, -6), H(-3, -9)
Dilate with respect to the origin using a scale factor of $\frac{2}{3}$. Then translate 6 units up.
25. J(1, 1), K(3, 4), L(5, 1)
Rotate 90° clockwise about the origin. Then dilate with respect to the origin using a scale factor of 3.
26. P(-2, 2), Q(4, 2), R(2, -6), S(-4, -6)
Dilate with respect to the origin using a scale factor of 5. Then dilate with respect to the origin using a scale factor of 0.5.

The red figure is similar to the blue figure. Describe a sequence of transformations in which the blue figure is the image of the red figure.



29. **STRUCTURE** In Exercises 27 and 28, is the blue figure still the image of the red figure when you perform the sequence in the opposite order? Explain.