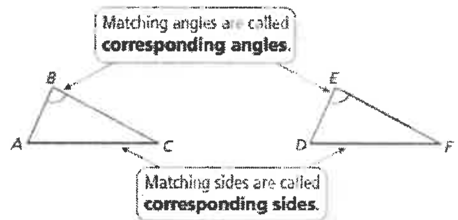
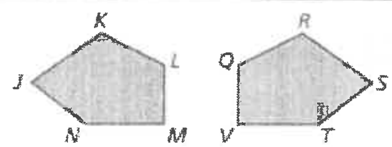
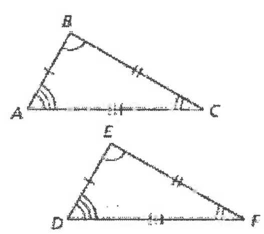
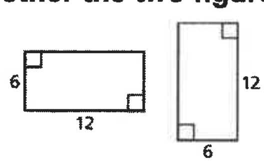
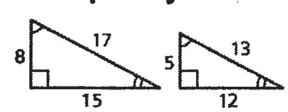
Name ______________________________ Class Period __________

Chapter 2 **Pre-Algebra**	**Transformations**
MAFS.8.G.1	Understand congruence and similarity using physical models, transparencies, or geometry software.
Essential Question	How can I tell if two figures are congruent? In this lesson I am *using the definition of congruency*, so I can *tell if two figures are congruent.*
2.1 Congruent Figures	**Key Idea** **Congruent Figures** Figures that have the same size and the same shape are called **congruent figures.** The triangles below are congruent. 
	1. The figures are congruent. Name the corresponding angles and the corresponding sides. 
	Key Idea **Identifying Congruent Figures** Two figures are congruent when corresponding angles and corresponding sides are congruent. Triangle *ABC* is congruent to Triangle *DEF*. $\triangle ABC \cong \triangle DEF$ 
	Tell whether the two figures are congruent. Explain your reasoning. **2.**  **3.** 

MAFS.8.G.1.1	Verify experimentally the properties of rotations, reflections, and translations: • MAFS.8.G.1.1a Lines are taken to lines, and line segments to line segments of the same length. • MAFS.8.G.1.1b Angles are taken to angles of the same measure. • MAFS.8.G.1.1c Parallel lines are taken to parallel lines.
Essential Question	How can you tell if a figure has been translated? In this lesson I am *using the definition of translation*, so I can *use it to identify translations and create translated figures.*

2.2 Translations

A **transformation** changes a figure into another figure. The new figure is called the **image**.

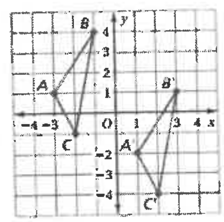
A **translation** is a transformation in which a figure *slides* but does not turn. Every point of the figure moves the same distance and in the same direction.

Key Idea

Translations in the Coordinate Plane

Words To translate a figure a units horizontally and b units vertically in a coordinate plane, add a to the x-coordinates and b to the y-coordinates of the vertices.

Positive values of a and b represent translations up and right. Negative values of a and b represent translations down and left.

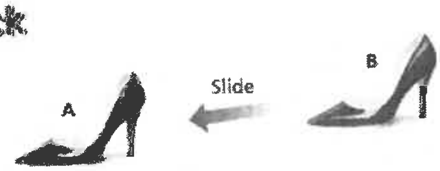


Algebra $(x, y) \rightarrow (x + a, y + b)$

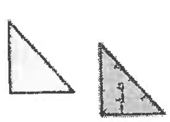
In a translation, the original figure and its image are congruent.

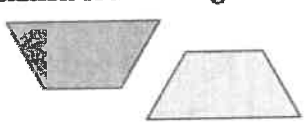
Vocabulary and Concept Check

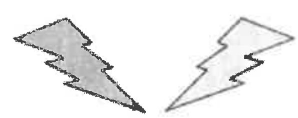
1. **VOCABULARY** Which figure is the image?
2. **VOCABULARY** How do you translate a figure in a coordinate plane?
3. **WRITING** Can you translate the letters in the word TOKYO to form the word KYOTO? Explain.

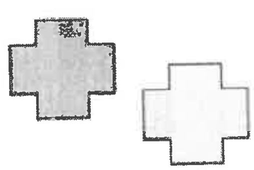


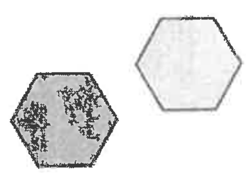
Tell whether the blue figure is a translation of the red figure.

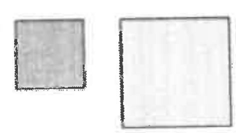
4. 

5. 

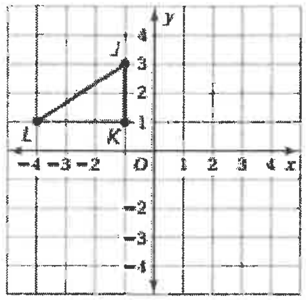
6. 

7. 

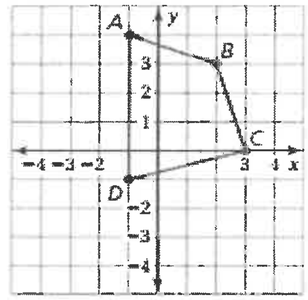
8. 

9. 

10. Translate the triangle 4 units right and 3 units down. What are the coordinates of the image?



11. Translate the figure 2 units left and 4 units down. What are the coordinates of the image?



The vertices of a triangle are $L(0, 1)$, $M(1, -2)$, and $N(-2, 1)$. Draw the figure and its image after the translation.

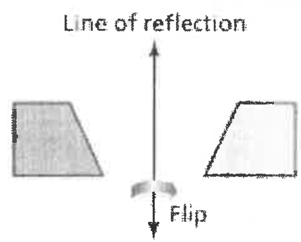
12. 1 unit left and 6 units up

13. 5 units right

14. $(x + 2, y + 3)$

15. $(x - 3, y - 4)$

MAFS.8.G.1.1	Verify experimentally the properties of rotations, reflections, and translations: • MAFS.8.G.1.1a Lines are taken to lines, and line segments to line segments of the same length. • MAFS.8.G.1.1b Angles are taken to angles of the same measure. • MAFS.8.G.1.1c Parallel lines are taken to parallel lines.
Essential Question	How can you tell if a figure has been reflected In this lesson I am *using the definition of reflection*, so I can *use it to identify reflections and create reflected figures.*
2.3 Reflections	A **reflection**, or *flip*, is a transformation in which a figure is reflected in a line called the **line of reflection**. A reflection creates a mirror image of the original figure.



Key Idea

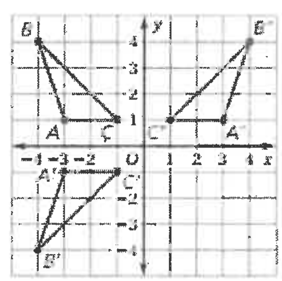
Reflections in the Coordinate Plane

Words To reflect a figure in the x-axis, take the opposite of the y-coordinate.

To reflect a figure in the y-axis, take the opposite of the x-coordinate.

Algebra Reflection in x-axis: $(x, y) \rightarrow (x, -y)$

Reflection in y-axis: $(x, y) \rightarrow (-x, y)$



In a reflection, the original figure and its image are congruent.

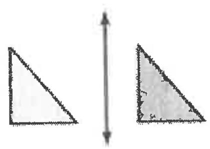
Vocabulary and Concept Check

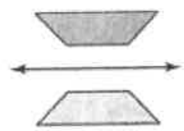
1. **WHICH ONE DOESN'T BELONG?** Which transformation does *not* belong with the other three? Explain your reasoning.

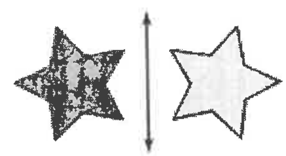
2. **WRITING** How can you tell when one figure is a reflection of another figure?

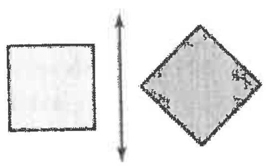
3. **REASONING** A figure lies entirely in Quadrant I. The figure is reflected in the x-axis. In which quadrant is the image?

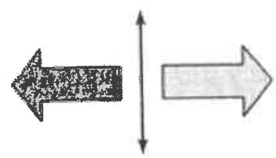
Tell whether the blue figure is a reflection of the red figure.

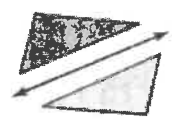
4. 

5. 

6. 

7. 

8. 

9. 

Draw the figure and its reflection in the x-axis. Identify the coordinates of the image.

10. $A(3, 2)$, $B(4, 4)$, $C(1, 3)$
11. $M(-2, 1)$, $N(0, 3)$, $P(2, 2)$
12. $H(2, -2)$, $J(4, -1)$, $K(6, -3)$, $L(5, -4)$
13. $D(-2, -1)$, $E(0, -1)$, $F(0, -5)$, $G(-2, -5)$

Draw the figure and its reflection in the y-axis. Identify the coordinates of the image.

14. $Q(-4, 2)$, $R(-2, 4)$, $S(-1, 1)$
15. $T(4, -2)$, $U(4, 2)$, $V(6, -2)$
16. $W(2, -1)$, $X(5, -2)$, $Y(5, -5)$, $Z(2, -4)$
17. $J(2, 2)$, $K(7, 4)$, $L(9, -2)$, $M(3, -1)$

MAFS.8.G.1.1	Verify experimentally the properties of rotations, reflections, and translations: • MAFS.8.G.1.1a Lines are taken to lines, and line segments to line segments of the same length. • MAFS.8.G.1.1b Angles are taken to angles of the same measure. • MAFS.8.G.1.1c Parallel lines are taken to parallel lines.
Essential Question	How can you tell if a figure has been rotated? In this lesson I am *using the definition of rotation*, so I can *use it to identify rotations and create rotated figures.*

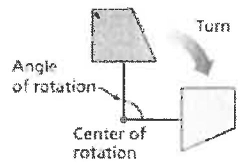
2.4 Rotations

Key Idea

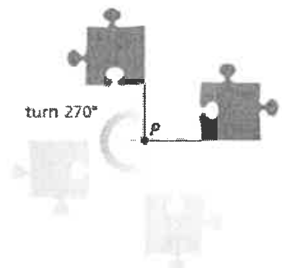
Rotations

A **rotation**, or *turn*, is a transformation in which a figure is rotated about a point called the **center of rotation.** The number of degrees a figure rotates is the **angle of rotation.**

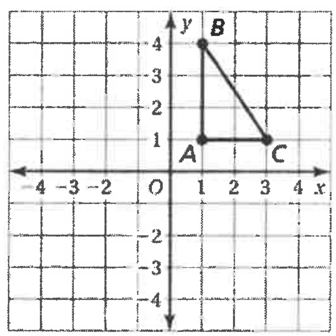
In a rotation, the original figure and its image are congruent.



Rotate the puzzle piece 270° clockwise about point *P*.

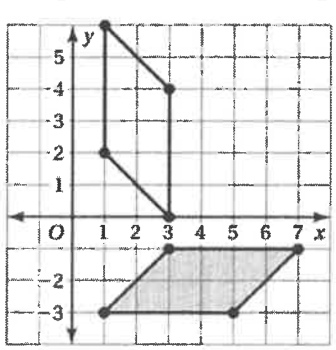


1. Rotate the triangle $180°$ about the origin. Find the coordinates of the image.

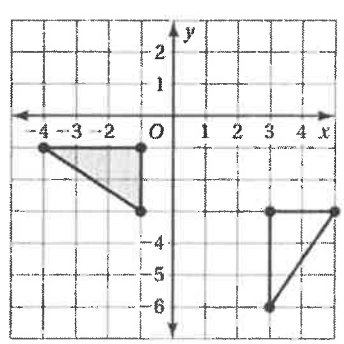


The shaded figure is congruent to the nonshaded figure. Describe two different sequences of transformations in which the nonshaded figure is the image of the shaded figure.

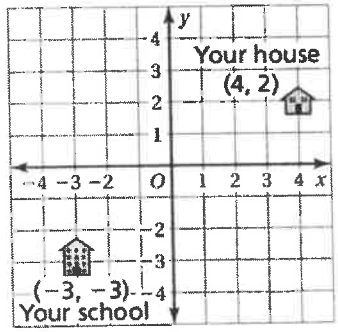
2.



3.



4. A map of your neighborhood is represented on the grid.



a. Describe a translation of your walk from school to your house.

b. The pizza parlor is a reflection in the y-axis of your school. What are the coordinates of the pizza parlor?

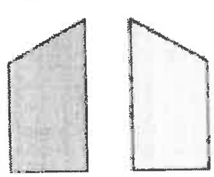
c. The transformation from your house to the park is a 90° clockwise rotation about the origin. What are the coordinates of the park?

5. The vertices of a triangle are $A(-2, 4)$, $B(1, 2)$, and $C(-2, -2)$. Reflect the triangle in the y-axis, and then rotate the image 90° counterclockwise about the origin. What are the coordinates of the image?

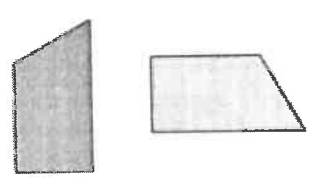
6. The vertices of a kite are $W(2, 2)$, $X(4, 3)$, $Y(5, 2)$, and $Z(4, 1)$. Reflect the figure in the y-axis, and then translate the image 3 units right and 4 units down. What are the coordinates of the image?

Identify the transformation.

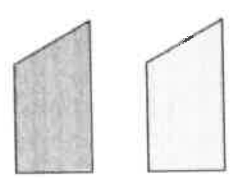
7.



8.

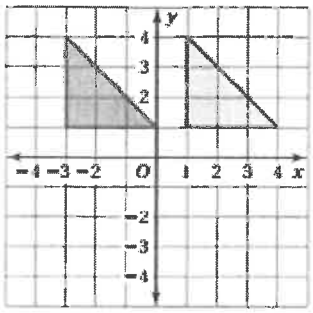


9.

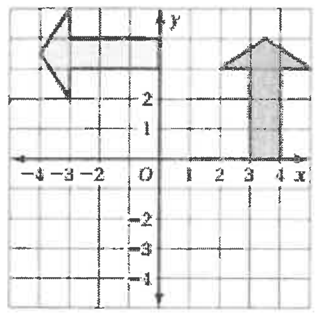


Tell whether the blue figure is a rotation of the red figure about the origin. If so, give the angle and direction of rotation.

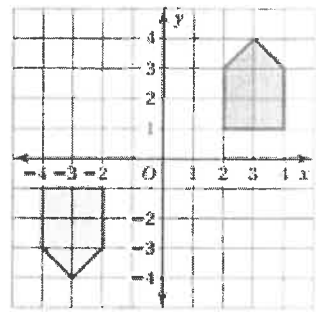
10.



11.



12.



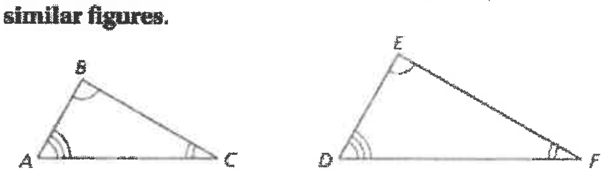
MAFS.8.G.1	Understand congruence and similarity using physical models, transparencies, or geometry software.
Essential Question	How can you use proportions to help you make decisions in art and design? In this lesson I am *using what I know about proportions*, so I can *identify and create proportional (similar) figures.*

2.5 Similar Figures

Key Idea

Similar Figures

Figures that have the same shape but not necessarily the same size are called **similar figures.**



Triangle *ABC* is similar to Triangle *DEF*.

Words Two figures are similar when

- corresponding side lengths are proportional and
- corresponding angles are congruent.

Symbols

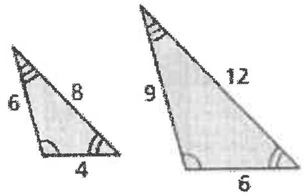
Side Lengths	*Angles*	*Figures*
$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$	$\angle A \cong \angle D$ $\angle B \cong \angle E$ $\angle C \cong \angle F$	$\triangle ABC \sim \triangle DEF$

Vocabulary and Concept Check

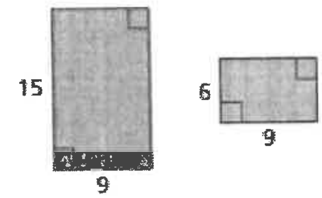
1. **VOCABULARY** How are corresponding angles of two similar figures related?
2. **VOCABULARY** How are corresponding side lengths of two similar figures related?
3. **CRITICAL THINKING** Are two figures that have the same size and shape similar? Explain.

Tell whether the two figures are similar. Explain your reasoning.

4.



5.



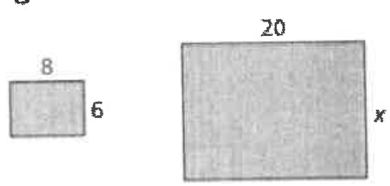
In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

6. Rectangle A: (0, 0), (4, 0), (4, 2), (0, 2)
Rectangle B: (0, 0), (−6, 0), (−6, 3), (0, 3)
Rectangle C: (0, 0), (4, 0), (4, 2), (0, 2)

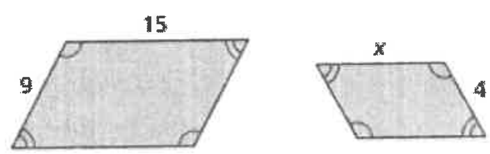
7. Figure A: (−4, 2), (−2, 2), (−2, 0), (−4, 0)
Figure B: (1, 4), (4, 4), (4, 1), (1, 1)
Figure C: (2, −1), (5, −1), (5, −3), (2, −3)

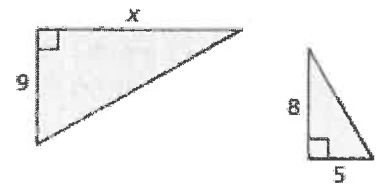
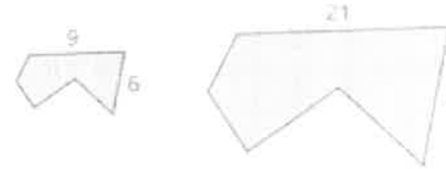
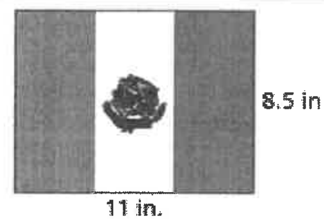
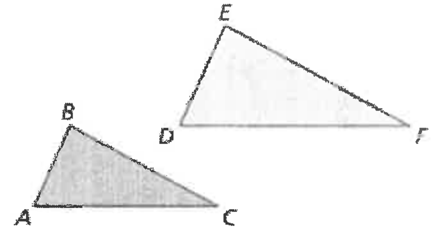
The figures are similar. Find *x*.

8.



9.



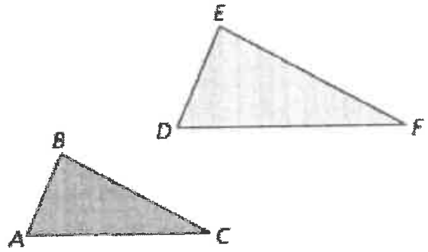
	10.  **11.** 
	12. MEXICO A Mexican flag is 63 inches long and 36 inches wide. Is the drawing at the right similar to the Mexican flag? 
	13. DESKS A student's rectangular desk is 30 inches long and 18 inches wide. The teacher's desk is similar to the student's desk and has a length of 50 inches. What is the width of the teacher's desk?
MAFS.8.G.1.1	Verify experimentally the properties of rotations, reflections, and translations: • MAFS.8.G.1.1a Lines are taken to lines, and line segments to line segments of the same length. • MAFS.8.G.1.1b Angles are taken to angles of the same measure. • MAFS.8.G.1.1c Parallel lines are taken to parallel lines.
Essential Question	How do changes in dimensions of similar figures affect the perimeter and area? In this lesson I am *using what I know about similar figures, perimeter, and area*, so I can *find a relationship between them.*
2.6 Perimeters and Areas of Similar Figures	**Key Idea** **Perimeters of Similar Figures** When two figures are similar, the ratio of their perimeters is equal to the ratio of their corresponding side lengths. $\frac{\text{Perimeter of } \triangle ABC}{\text{Perimeter of } \triangle DEF} = \frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$ 

1. The height of Figure A is 9 feet. The height of a similar Figure B is 15 feet. What is the ratio of the perimeter of A to the perimeter of B?

Key Idea

Areas of Similar Figures

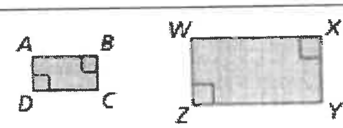
When two figures are similar, the ratio of their areas is equal to the *square* of the ratio of their corresponding side lengths.



$$\frac{\text{Area of } \triangle ABC}{\text{Area of } \triangle DEF} = \left(\frac{AB}{DE}\right)^2 = \left(\frac{BC}{EF}\right)^2 = \left(\frac{AC}{DF}\right)^2$$

2. The base of Triangle P is 8 meters. The base of a similar Triangle Q is 7 meters. What is the ratio of the area of P to the area of Q?

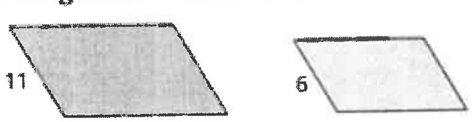
3. **NUMBER SENSE** Rectangle *ABCD* is similar to Rectangle *WXYZ*. The area of *ABCD* is 30 square inches. Explain how to find the area of *WXYZ*.



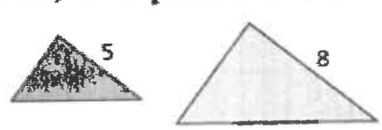
$\frac{AD}{WZ} = \frac{1}{2}$ $\quad \frac{AB}{WX} = \frac{1}{2}$

The two figures are similar. Find the ratios (red to blue) of the perimeters and of the areas.

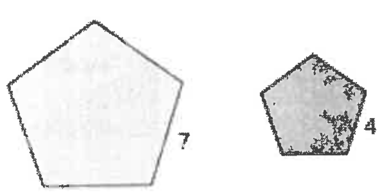
4.



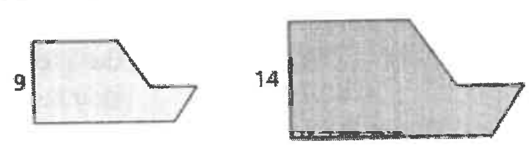
5.

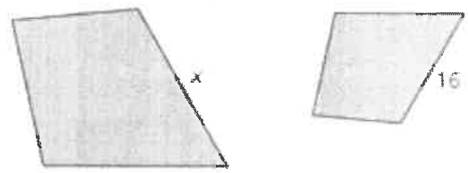


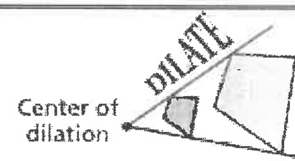
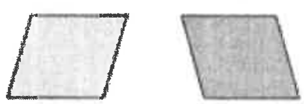
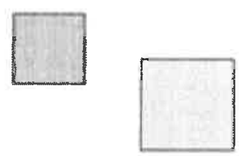
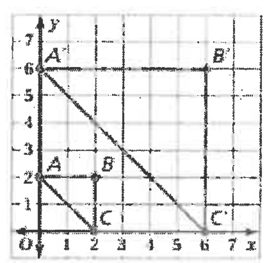
6.



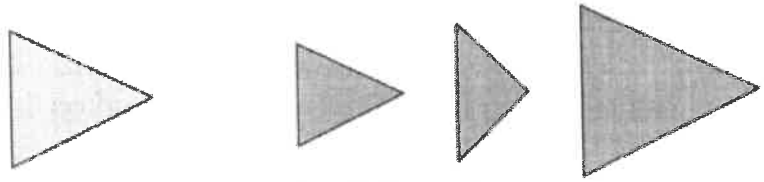
7.



	8. PERIMETER How does doubling the side lengths of a right triangle affect its perimeter?
	9. AREA How does tripling the side lengths of a right triangle affect its area?
	The figures are similar. Find x. **10.** The ratio of the perimeters is 7 : 10.  **11.** The ratio of the perimeters is 8 : 5. 

MAFS.8.G.1.1	Verify experimentally the properties of rotations, reflections, and translations: • MAFS.8.G.1.1a Lines are taken to lines, and line segments to line segments of the same length. • MAFS.8.G.1.1b Angles are taken to angles of the same measure. • MAFS.8.G.1.1c Parallel lines are taken to parallel lines.
Essential Question	How can you tell if a figure has been dialated? In this lesson I am *using the definition of dialation*, so I can *use it to identify dialations and create dialated figures.*
2.7 Dialations	A **dilation** is a transformation in which a figure is made larger or smaller with respect to a point called the **center of dilation**. 
	Tell whether the blue figure is a dilation of the red figure. Explain. **1.**  **2.** 
	In a dilation, the original figure and its image are similar. The ratio of the side lengths of the image to the corresponding side lengths of the original figure is the **scale factor** of the dilation. **Key Idea** **Dilations in the Coordinate Plane** **Words** To dilate a figure with respect to the origin, multiply the coordinates of each vertex by the scale factor k. **Algebra** $(x, y) \rightarrow (kx, ky)$ • When $k > 1$, the dilation is an enlargement. • When $k > 0$ and $k < 1$, the dilation is a reduction. 

3. **REASONING** Which figure is *not* a dilation of the blue figure? Explain.



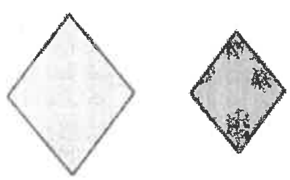
Draw the triangle with the given vertices. Multiply each coordinate of the vertices by 3, and then draw the new triangle. How are the two triangles related?

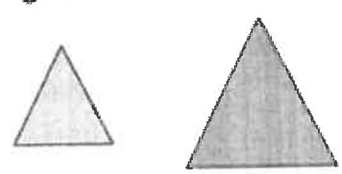
4. (0, 2), (3, 2), (3, 0)

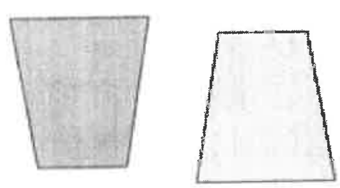
5. (−1, 1), (−1, −2), (2, −2)

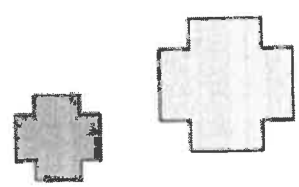
6. (−3, 2), (1, 2), (1, −4)

Tell whether the blue figure is a dilation of the red figure.

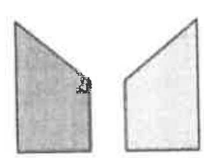
7. 

8. 

9. 

10. 

11. 

12. 

The vertices of a figure are given. Draw the figure and its image after a dilation with the given scale factor. Identify the type of dilation.

13. $A(1, 1)$, $B(1, 4)$, $C(3, 1)$; $k = 4$

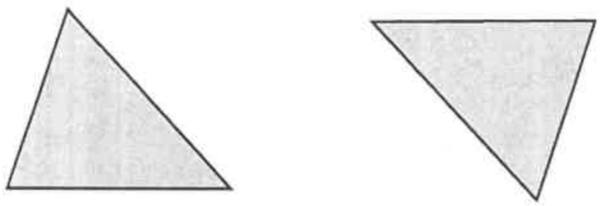
14. $D(0, 2)$, $E(6, 2)$, $F(6, 4)$; $k = 0.5$

Name____ Date__________

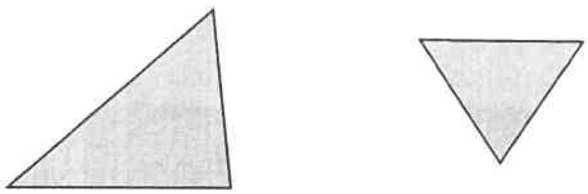
2.1 Practice A

Tell whether the triangles are *congruent* or *not congruent*.

1.

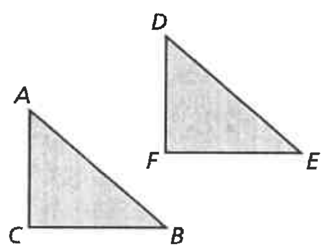


2.

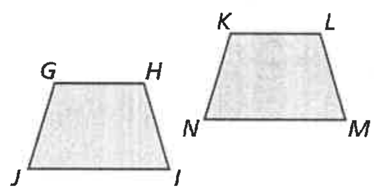


The figures are congruent. Name the corresponding angles and the corresponding sides.

3.

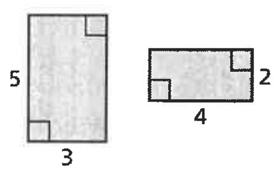


4.

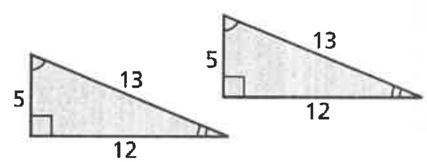


Tell whether the two figures are congruent. Explain your reasoning.

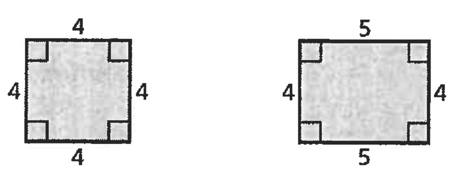
5.



6.



7. Describe and correct the error in telling whether the two figures are congruent.



> ✗ Both figures have four sides and corresponding angle measures are equal. So, they are congruent.

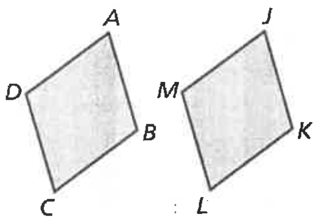
8. Can two polygons be congruent if one has a right angle and the other does not? Explain.

Name ______________________________ Date __________

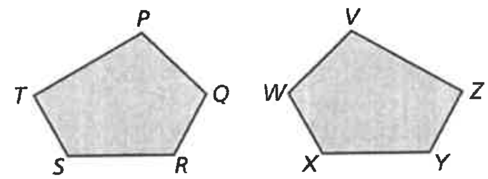
2.1 Practice B

The figures are congruent. Name the corresponding angles and the corresponding sides.

1.

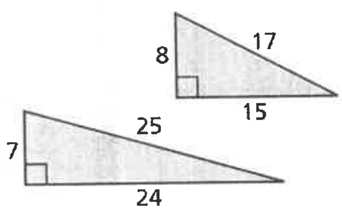


2.

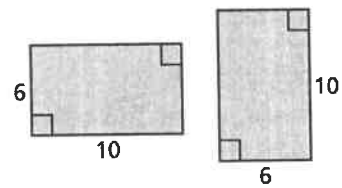


Tell whether the two figures are congruent. Explain your reasoning.

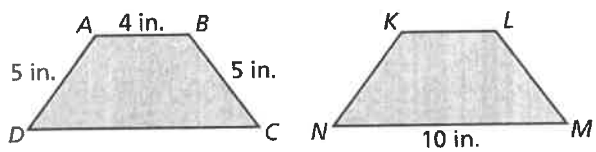
3.



4.



5. The figures are congruent.

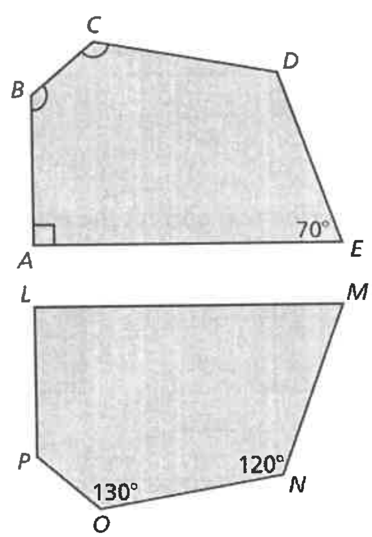


a. What is the length of side CD?

b. Which angle of $KLMN$ corresponds to $\angle B$?

c. What is the perimeter of $ABCD$?

6. The pentagons are congruent. Determine whether the statement is *true* or *false*. Explain your reasoning.



a. $\angle B$ is congruent to $\angle C$.

b. Side MN is congruent to side AE.

c. $\angle B$ corresponds to $\angle O$.

d. Side BC is congruent to side PO.

e. The sum of the angle measures of $LMNOP$ is 540°.

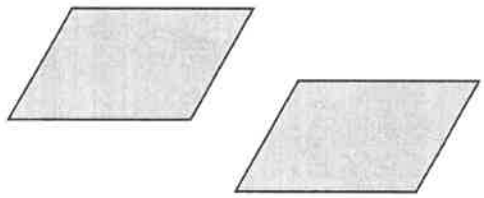
f. The measure of $\angle B$ is 120°.

Name____ Date__________

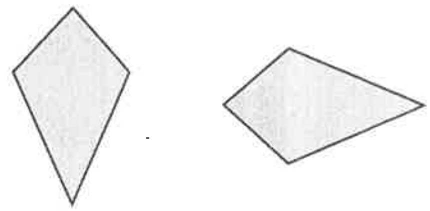
2.2 Practice A

Tell whether the right figure is a translation of the left figure.

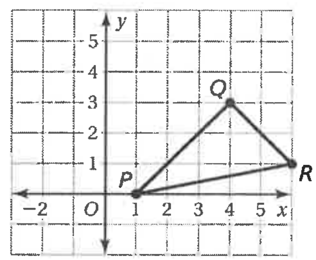
1.



2.



3. Translate the triangle 3 units left and 2 units up. What are the coordinates of the image?

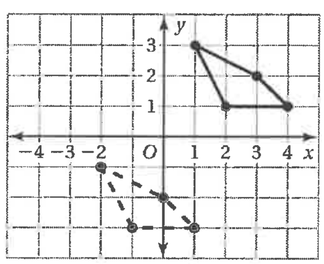


The vertices of a triangle are $A(-2, 0)$, $B(0, 3)$, and $C(2, 2)$. Draw the figure and its image after the translation.

4. 4 units down

5. 2 units right and 1 unit up

6. Describe the translation from the solid line figure to the dashed line figure.



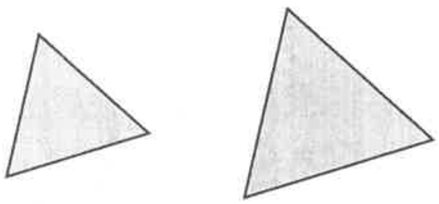
7. In Exercise 6, describe the translation from the dashed line figure to the solid line figure.

Name ____________________ Date ________

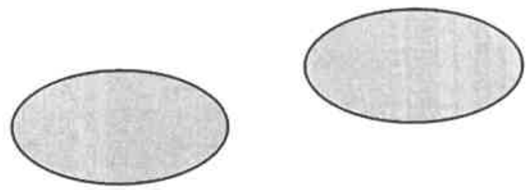
2.2 Practice B

Tell whether the right figure is a translation of the left figure.

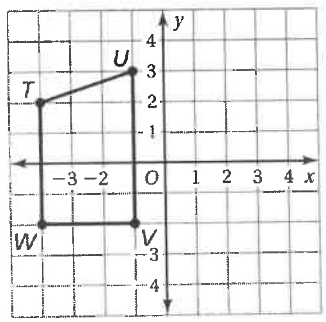
1.



2.



3. Translate the figure 5 units right and 1 unit up. What are the coordinates of the image?



Describe the translation of the point to its image.

4. $(1, 5) \rightarrow (-1, 1)$

5. $(-2, -3) \rightarrow (-2, 4)$

6. A square is translated 3 units left and 5 units down. Then the image is translated 4 units right and 2 units down.

a. Describe the translation of the original square to the ending position.

b. Describe the translation of the ending position to the original square.

7. You rearrange your bedroom. Tell whether each move is an example of a translation.

a. You slide your bed 1 foot along the wall.

b. You move your desk and chair to the opposite wall.

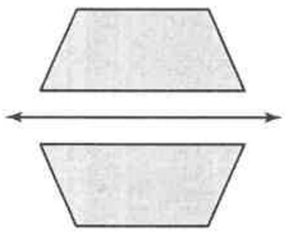
c. You move your bed stand to the other side of the bed.

Name____ Date__________

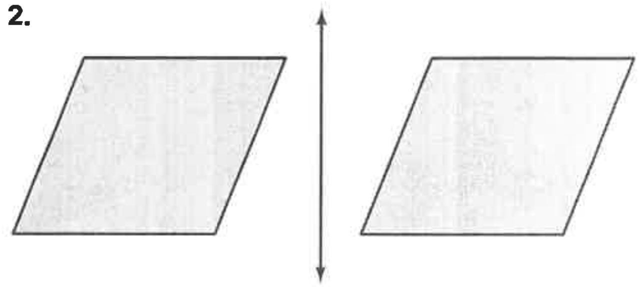
2.3 Practice A

Tell whether one figure is a reflection of the other figure.

1.



2.



Draw the figure and its reflection in the *x*-axis. Identify the coordinates of the image.

3. $E(0, 2)$, $F(3, 1)$, $G(4, 3)$

4. $H(-3, 2)$, $I(-1, 5)$, $J(2, 1)$

Draw the figure and its reflection in the *y*-axis. Identify the coordinates of the image.

5. $X(0, -1)$, $Y(2, 3)$, $Z(4, -2)$

6. $U(-5, 1)$, $V(-4, -2)$, $W(-2, 0)$

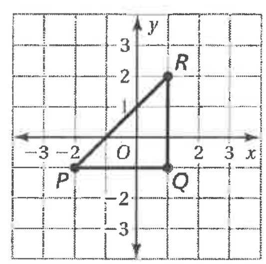
7. What does the word MOM spell when it is reflected in a horizontal line?

The coordinates of a point and its image are given. Is the reflection in the *x*-axis or *y*-axis?

8. $(-5, 2) \rightarrow (5, 2)$

9. $(4, 3) \rightarrow (4, -3)$

10. Translate the triangle 2 units left and 1 unit up. Then reflect the image in the x-axis. Graph the resulting triangle.



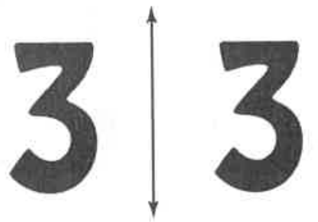
11. A figure is in Quadrant IV. The figure is reflected in the y-axis. In which quadrant is the image?

Name ____ Date __________

2.3 Practice B

Tell whether one figure is a reflection of the other figure.

1.



2.

Draw the figure and its reflection in the *x*-axis. Identify the coordinates of the image.

3. $K(-3, 3), L(-2, 1), M(1, 2), N(2, 5)$

4. $O(-2, -1), P(-1, -3), Q(1, -4), R(3, -1)$

Draw the figure and its reflection in the *y*-axis. Identify the coordinates of the image.

5. $B(2, -3), C(3, 1), D(5, 3), E(3, 0)$

6. $G(-5, -5), H(-3, -1), I(-2, 4), J(-1, -1)$

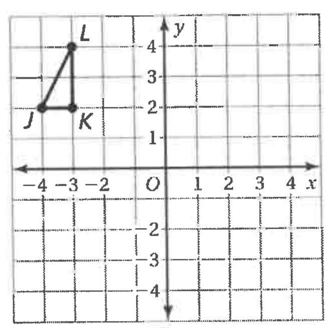
7. What does the word "pop" spell when it is reflected in a horizontal line?

The coordinates of a point and its image are given. Is the reflection in the *x*-axis or *y*-axis?

8. $(0, 3) \rightarrow (0, -3)$

9. $(1, 5) \rightarrow (-1, 5)$

10. Reflect the triangle in the x-axis. Then reflect the image in the y-axis. Graph the resulting triangle.



11. $\triangle ABC$ has vertices $A(-2, -1), B(4, 2), C(2, -2)$.

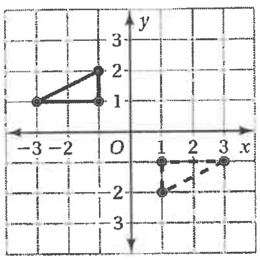
   a. Reflect $\triangle ABC$ in the x-axis. Then reflect $\triangle A'B'C'$ in the y-axis. What are the coordinates of the resulting triangle?

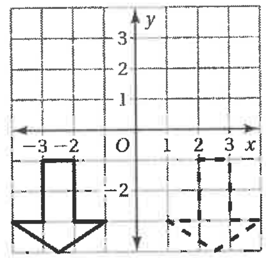
   b. How are the x- and y-coordinates of the resulting triangle related to the x- and y-coordinates of $\triangle ABC$?

Name______________________________ Date__________

2.4 Practice A

Tell whether the dashed figure is a rotation of the solid figure about the origin. If so, give the angle and direction of rotation.

1. 

2. 

The vertices of a triangle are $A(-4, 1)$, $B(-2, 2)$, and $C(-1, 1)$. Rotate the triangle as described. Find the coordinates of the image.

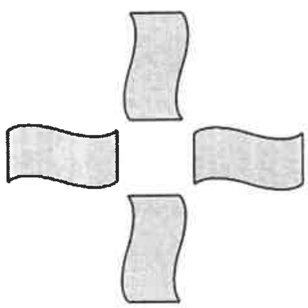
3. 270° clockwise about the origin

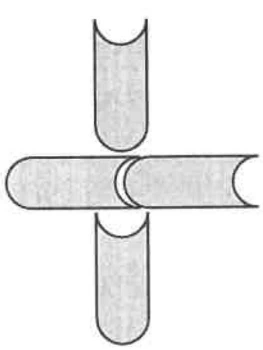
4. 90° counterclockwise about the origin

5. 90° counterclockwise about vertex A

6. 180° about vertex C

Tell whether the figure has rotational symmetry.

7. 

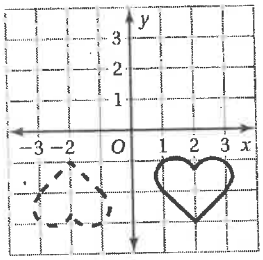
8. 

Name ____ Date __________

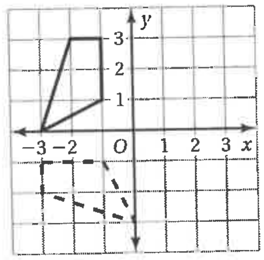
2.4 Practice B

Tell whether the dashed figure is a rotation of the solid figure about the origin. If so, give the angle and direction of rotation.

1.



2.



The vertices of a trapezoid are $A(1, 1)$, $B(2, 2)$, $C(4, 2)$, and $D(5, 1)$. Rotate the trapezoid as described. Find the coordinates of the image.

3. 90° clockwise about the origin

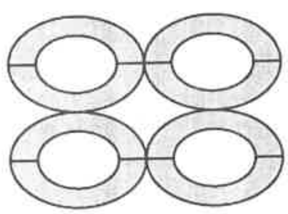
4. 270° counterclockwise about the origin

5. 90° clockwise about vertex A

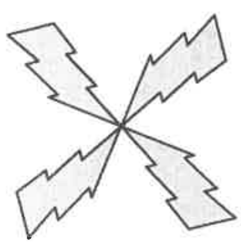
6. 180° about vertex D

Tell whether the figure has rotational symmetry.

7.



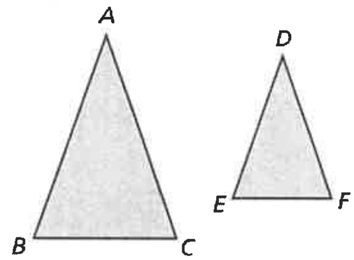
8.



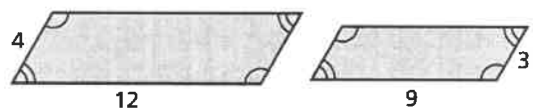
Name____ Date__________

2.5 Practice A

1. Name the corresponding angles and the corresponding sides of the similar figures.

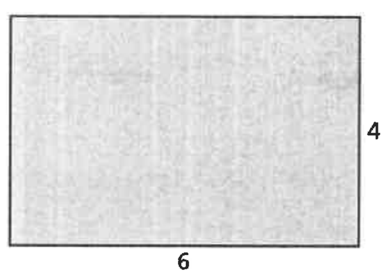


2. Tell whether the two figures are similar. Explain your reasoning.



3. The rectangular traffic sign is 18 inches wide and 8 inches tall. The rectangular realtor sign is 27 inches wide and 10 inches tall. Are the signs similar?

4. The given rectangle needs to be modified.



   a. Each side length is increased by 2.

   Is the new rectangle similar to the original?

   b. Each side length is increased by 50%.

   Is the new rectangle similar to the original?

5. Which of the following card dimensions are similar rectangles?

2 in. by 5 in.	3 in. by 6 in.
1 in. by 3 in.	1 in. by 2.5 in.

Name ______________________________ Date ________

2.5 Practice B

1. In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

   Rectangle A: (0, 0), (3, 0), (3, 2), (0, 2)

   Rectangle B: (0, 0), (1, 0), (1, 3), (0, 3)

   Rectangle C: (0, 0), (2, 0), (2, −3), (0, −3)

2. A rectangular index card is 6 inches long and 4 inches wide. A rectangular note card is 1.5 inches long and 1 inch wide. Are the cards similar?

3. Given $\triangle PQR \sim \triangle TUV$. Name the corresponding angles and the corresponding sides.

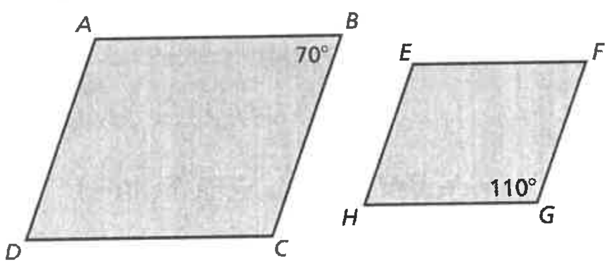
The two parallelograms are similar. Find the degree measure of the angle.

4. $\angle A$

5. $\angle H$

6. $\angle D$

7. $\angle F$



8. Is it possible for the following figures to be similar? Explain.
   a. A stop sign and a speed limit sign
   b. A cell phone and a test paper
   c. A yield sign and a home plate
   d. A laptop and a swimming pool

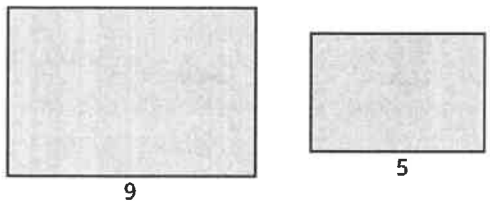
9. Can you draw two triangles each having two 45° angles and one 90° angle that are *not* similar? Justify your answer.

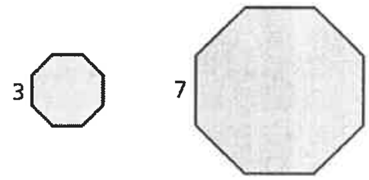
10. You have a triangle that has side lengths of 6, 9, and 12.
    a. Give the side lengths of a similar triangle that is smaller than the given triangle.
    b. Give the side lengths of a similar triangle that is larger than the given triangle.
    c. Each side length is increased by 30%. Is the new triangle similar to the original?

Name______________________________ Date__________

2.6 Practice A

The two figures are similar. Find the ratio (small to large) of the perimeters and of the areas.

1. 

2. 

3. How does doubling the side lengths of a triangle affect its area?

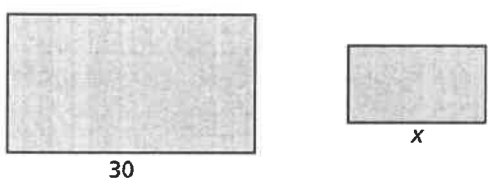
4. The ratio of the corresponding side lengths of two similar rectangular tables is 4 : 5.

   a. What is the ratio of the perimeters?

   b. What is the ratio of the areas?

   c. The perimeter of the larger table is 44 feet. What is the perimeter of the smaller table?

5. The figures are similar. The ratio of the perimeters is 5 : 9. Find x.



6. The ratio of the area of Triangle A to Triangle B is 16 : 49. Triangle A is similar to Triangle B.

   a. Which triangle is larger, A or B?

   b. A side length of Triangle B is 3.5 inches. What is the corresponding side length of Triangle A?

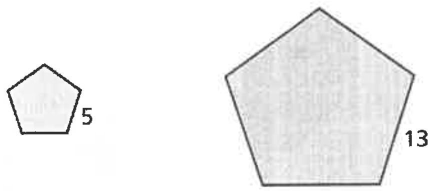
   c. What is the ratio of the perimeter of Triangle A to the perimeter of Triangle B?

   d. The side lengths of Triangle A are increased by 40%. The side lengths of Triangle B do not change. What is the new ratio of the area of Triangle A to Triangle B?

Name ____________________ Date ________

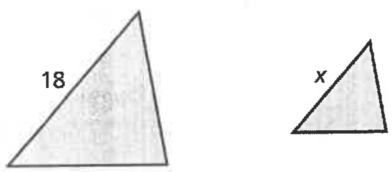
2.6 Practice B

1. The two figures are similar. Find the ratio (small to large) of the perimeters and of the areas.



2. How does tripling the side lengths of a pentagon affect its perimeter?

3. The figures are similar. The ratio of the perimeters is 12 : 7. Find x.



4. The ratio of the corresponding side lengths of two similar parallelogram signs is 9 : 14.

   a. What is the ratio of the perimeters?

   b. What is the ratio of the areas?

   c. One side length of the smaller sign is 45 feet. What is the side length of the corresponding side of the larger sign?

5. A window is put in a door. The window and the door are similar rectangles. The door has a width of 4 feet. The window has a width of 30 inches.

   a. How many times greater is the area of the door than the area of the window?

   b. The area of the door is 32 square feet. What is the area of the window?

   c. What is the perimeter of the window?

6. The area of Circle P is 4π. The area of Circle Q is 25π.

   a. What is the ratio of their areas?

   b. What is the ratio of their radii?

   c. The radius of Circle Q is decreased by 50%. What is the new circumference of Circle Q?

Name ______________________________ Date __________

2.7 Practice B

Draw the triangle with the given vertices. Multiply each coordinate of the vertices by 3 and draw the new triangle. How are the two triangles related?

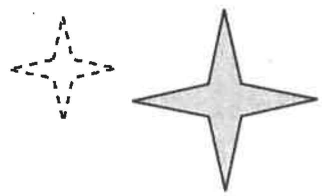
1. (0, 4), (−1, −3), (5, 2)

2. (−40, −20), (−20, 30), (40, −10)

Tell whether the dashed figure is a dilation of the solid figure.

3.

4.



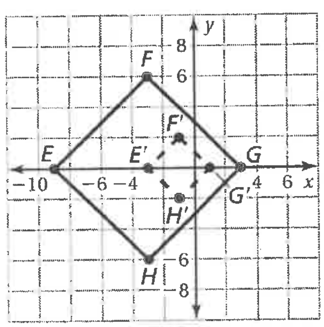
The vertices of a figure are given. Draw the figure and its image after dilation with the given scale factor. Identify the type of dilation.

5. $A(3, -1)$, $B(-4, 4)$, $C(-2, -3)$; $k = 5$

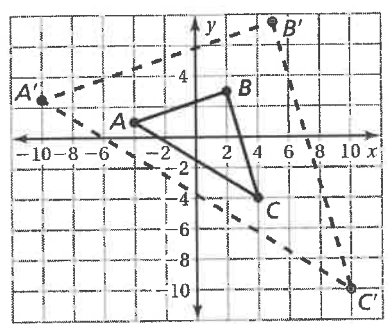
6. $D(10, 20)$, $E(-35, 10)$, $F(25, -30)$, $G(5, -20)$; $k = \frac{1}{5}$

The dashed figure is a dilation of the solid figure. Identify the type of dilation and find the scale factor.

7.



8.



9. A scale factor of 2 is used to find the dilation of a quadrilateral. What is the sum of the angles in the original quadrilateral? What is the sum of the angles after the dilation? What is the difference between the perimeter of the original figure and the perimeter of the image?

10. A triangle is dilated using a scale factor of $\frac{1}{2}$. The image is then dilated using a scale factor of $\frac{1}{3}$. What scale factor could you use to dilate the original triangle to get the final image?

Name____________________________________ Date__________

2.7 Practice A

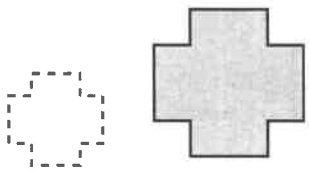
Draw the triangle with the given vertices. Multiply each coordinate of the vertices by 3 and then draw the new triangle. How are the two triangles related?

1. $(0, 0), (1, 3), (2, 1)$

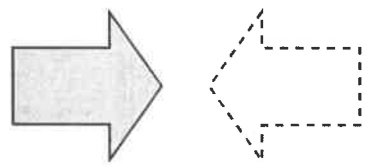
2. $(-3, -2), (-1, 4), (2, -2)$

Tell whether the dashed figure is a dilation of the solid figure.

3.



4.



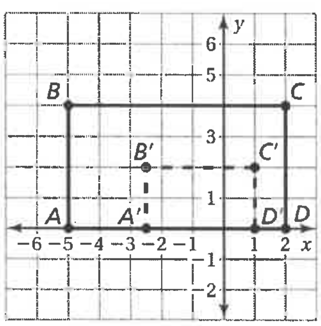
The vertices of a figure are given. Draw the figure and its image after a dilation with the given scale factor. Identify the type of dilation.

5. $A(-3, -2), B(2, 4), C(8, 1); k = \frac{1}{4}$

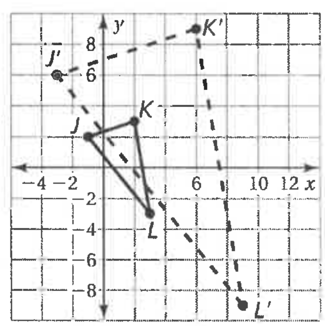
6. $D(1, 2), E(4, 1), F(1, -3), G(-3, -2); k = 5$

The dashed figure is a dilation of the solid figure. Identify the type of dilation and find the scale factor.

7.



8.



9. A triangle is dilated using a scale factor of 4. The image is then dilated using a scale factor of 3. What scale factor could you use to dilate the original triangle to get the final image?

10. The vertices of a figure are $P(1, 2)$, $Q(3, 4)$, and $R(-1, 6)$. Dilate with respect to the origin using a scale factor of 2 and then translate 4 units right and 3 units down. Find the coordinates of the figure after the transformations given.