Name_____ Date _____

2.4 Rotations

For use with Activity 2.4

Essential Question What are the three basic ways to move an object in a plane?

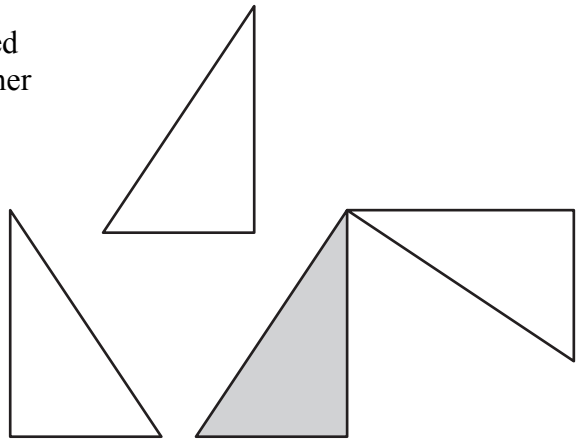
1 ACTIVITY: Three Basic Ways to Move Things

There are three basic ways to move objects on a flat surface.

_____ the object. _____ the object. _____ the object.

Work with a partner.

a. What type of triangle is the shaded triangle? Is it congruent to the other triangles? Explain.



b. Decide how you can move the shaded triangle to obtain each of the other triangles.

c. Is each move a *translation*, a *reflection*, or a *rotation*?

Section 2.4

Vocabulary and Concept Check

1. **VOCABULARY** What are the coordinates of the center of rotation in Example 2? Example 3?

MENTAL MATH **A figure lies entirely in Quadrant II. In which quadrant will the figure lie after the given clockwise rotation about the origin?**

2. 90°
3. 180°
4. 270°
5. 360°

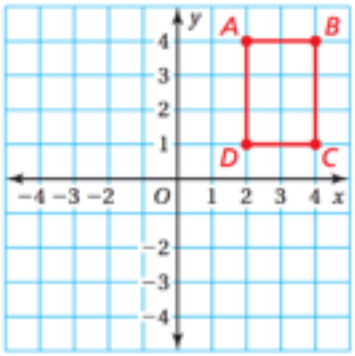
6. **DIFFERENT WORDS, SAME QUESTION** Which is different? Find "both" answers.

What are the coordinates of the figure after a 90° clockwise rotation about the origin?

What are the coordinates of the figure after a 270° clockwise rotation about the origin?

What are the coordinates of the figure after turning the figure 90° to the right about the origin?

What are the coordinates of the figure after a 270° counterclockwise rotation about the origin?



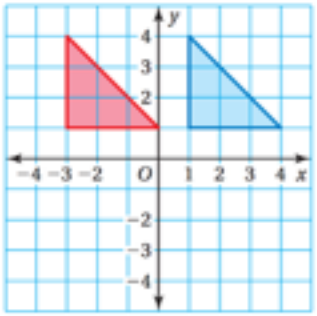
Identify the transformation.

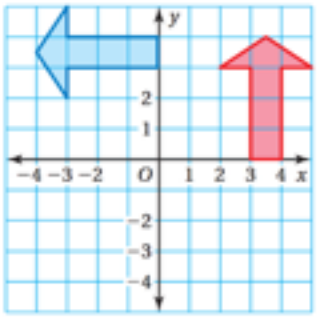
7. 

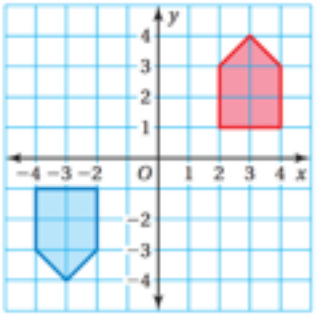
8. 

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.

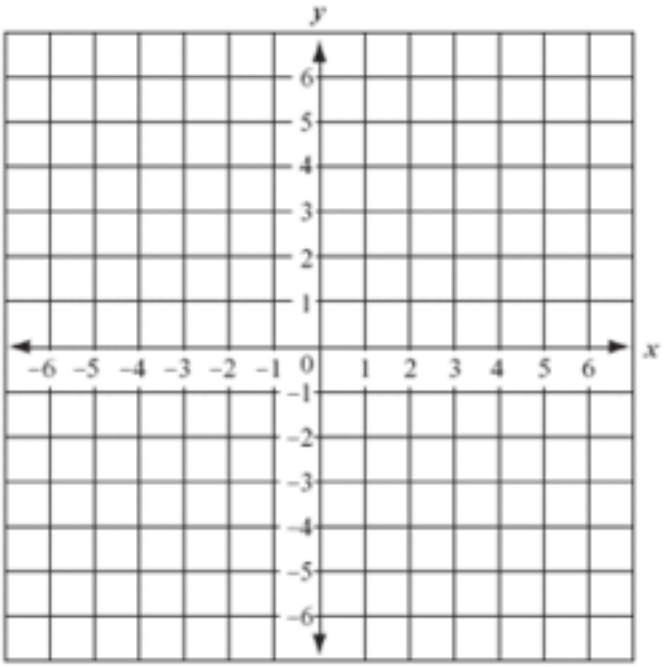
10. 

11. 

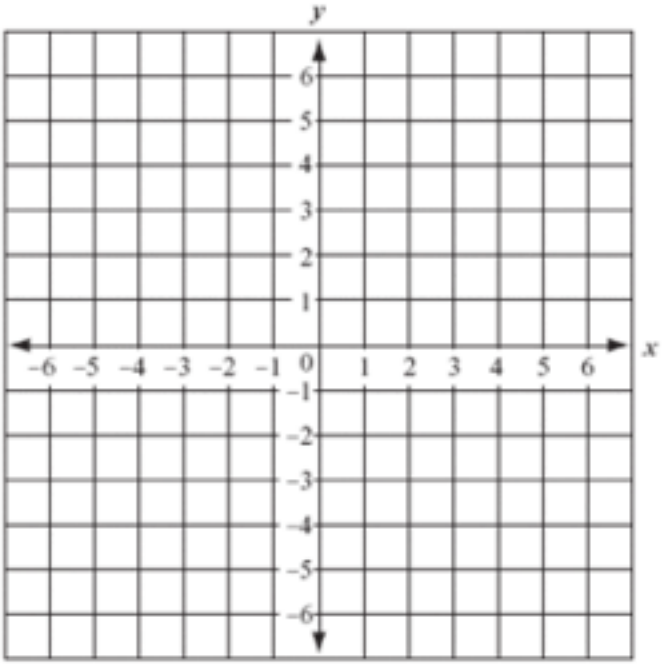
12. 

The vertices of a figures are given. Rotate the figure as described. Find the coordinates of the image.

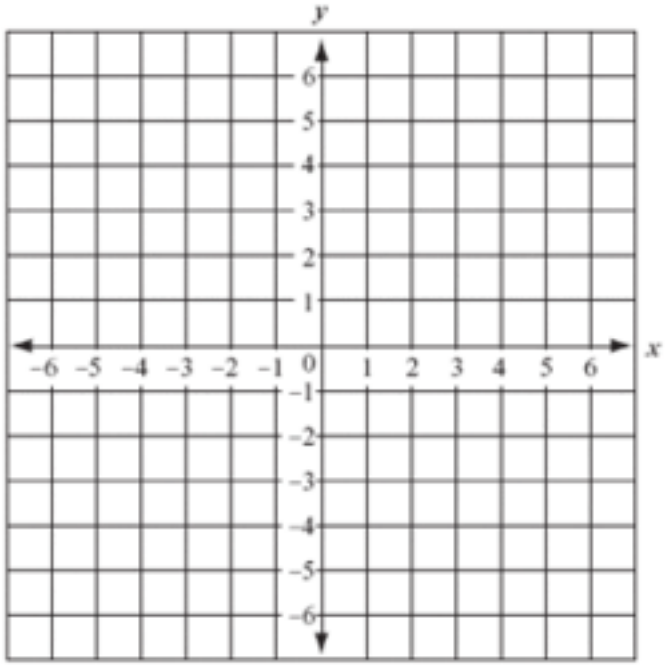
13. $A(2, -2), B(4, -1), C(4, -3), D(2, -4)$
90° counterclockwise about the origin



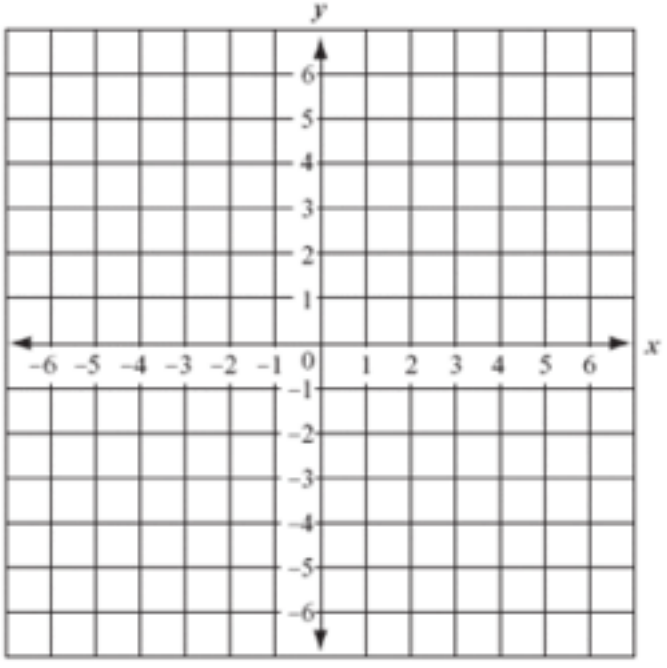
14. $F(1, 2), G(3, 5), H(3, 2)$
180° about the origin



15. $J(-4, 1), K(-2, 1), L(-4, -3)$
90° clockwise about vertex L

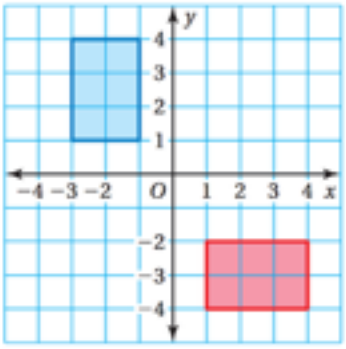


16. $P(-3, 4), Q(-1, 4), R(-2, 1), S(-4, 1)$
180° about vertex R

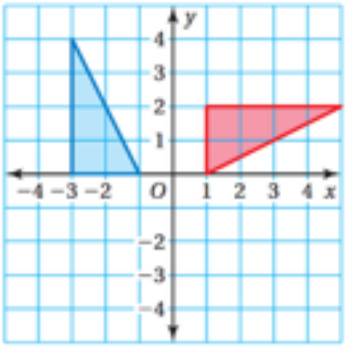


The red figure is congruent to the blue figure. Describe two different sequences of transformations in which the blue figure is the image of the red figure.

5 **24.**



25.



Start working on IXL R.6 and R.7 - Finish for homework

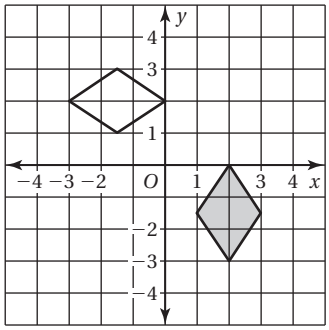
Name _____ Date _____

2.4 Practice

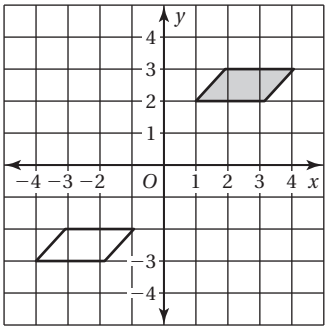
For use after Lesson 2.4

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

1.

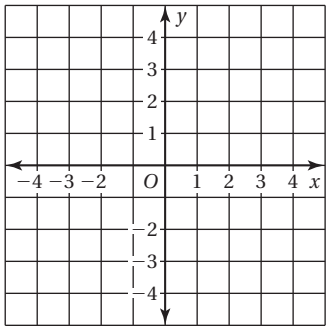


2.

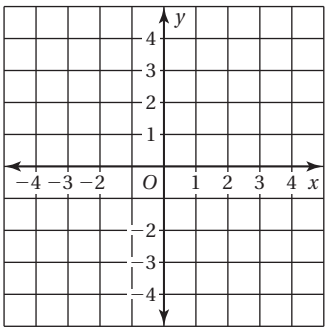


The vertices of a triangle are $A(1, 1)$, $B(3, 1)$, and $C(3, 4)$. Rotate the triangle as described. Find the coordinates of the image.

3. 90° clockwise about the origin



4. 270° counterclockwise about vertex A



5. A triangle is rotated 180° about the origin. Its image is reflected in the x-axis. The vertices of the final triangle are $(-4, -4)$, $(-2, -4)$, and $(-3, -1)$. What are the vertices of the original triangle?