

**LESSON**  
**9-3**

**Properties of Rotations**

**Reteach**

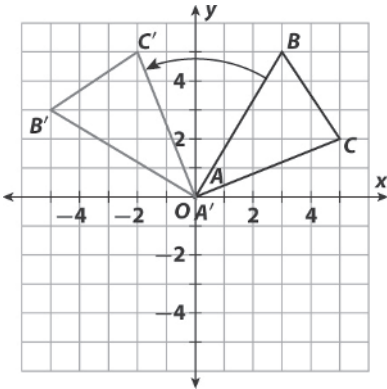
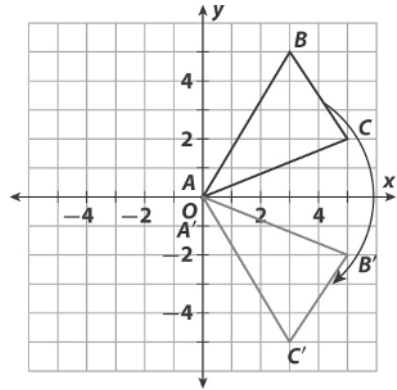
A **rotation** is a change in position of a figure.

A rotation will *turn* the figure around a point called the **center of rotation**.

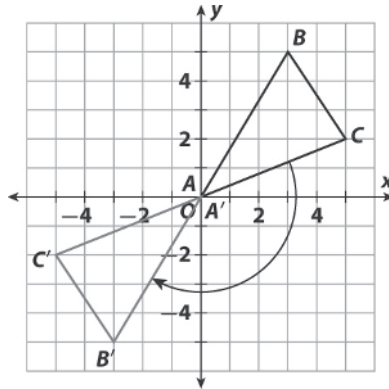
A rotation does not change the size of the figure.

At the right, triangle  $ABC$  has been rotated  $90^\circ$  clockwise. The resulting figure is triangle  $A'B'C'$ .

Below are two more rotations of triangle  $ABC$ .



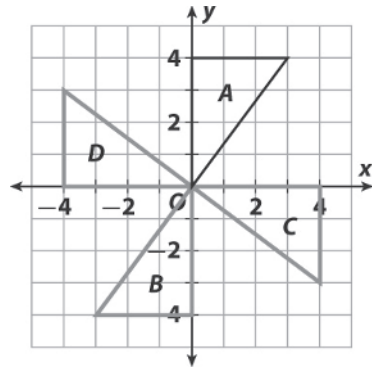
$90^\circ$  counterclockwise rotation



$180^\circ$  clockwise rotation

Use the figures at the right to answer each question. Triangle  $A$  has been rotated about the origin.

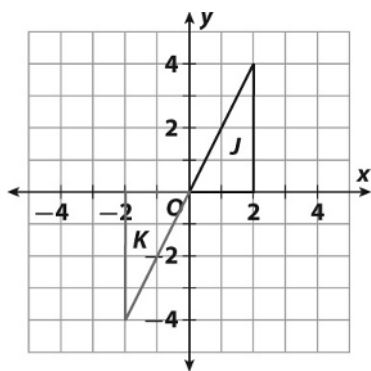
1. Which triangle shows a  $90^\circ$  counterclockwise rotation? \_\_\_\_\_
2. Which triangle shows a  $180^\circ$  clockwise rotation? \_\_\_\_\_
3. Which triangle shows a  $90^\circ$  clockwise rotation? \_\_\_\_\_
4. Which triangle shows a  $180^\circ$  counterclockwise rotation? \_\_\_\_\_
5. If the sides of triangle  $A$  have lengths of 3 cm, 4 cm, and 5 cm, what are the lengths of the sides of triangle  $B$ ?



- \_\_\_\_\_
6. Explain why the answers to Exercises 2 and 4 are the same.  
\_\_\_\_\_  
\_\_\_\_\_

### Practice and Problem Solving: D

1. B
2. C
3. B
4. D
5. 2 cm and 4 cm
6. I
7. I
8. III
9. II
- 10.



11. The image will be the same as triangle K.

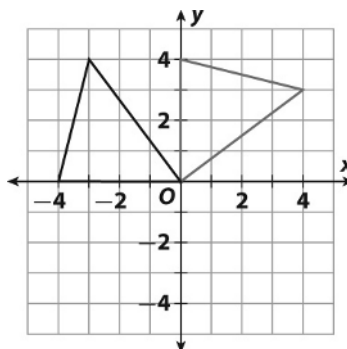
### Reteach

1. D
2. B
3. C
4. B
5. 3 cm, 4 cm, 5 cm
6. Sample answer: A rotation of  $180^\circ$  turns the figure a half-turn and will be the same whether turned clockwise or counterclockwise.

### Reading Strategies

1. Check student's answers. Sample answer: One side will go from the x-axis to the y-axis maintaining a length of 4. Vertex at  $(-3, 4)$  will go to  $(4, 3)$

2.



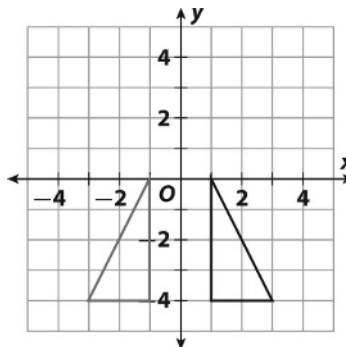
### Success for English Learners

1.  $90^\circ$  counterclockwise or  $270^\circ$  clockwise
2.  $90^\circ$  clockwise or  $270^\circ$  counterclockwise

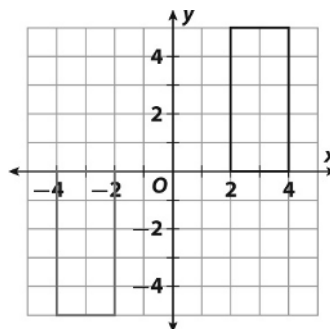
### LESSON 9-4

### Practice and Problem Solving: A/B

1.  $(x, y) \rightarrow (x, y - 5)$ ; translation down 5 units
2.  $(x, y) \rightarrow (-y, x)$ ; rotation  $90^\circ$  counterclockwise
3. reflection over the y-axis



4. rotation of  $180^\circ$



5.  $A'(2, 1)$ ,  $B'(-3, 2)$ ,  $C'(-1, 6)$
6. a  $90^\circ$  clockwise rotation