10-9

Name _____ Date _____

Rotations (Pages 464–467)

A **rotation** moves a figure about a central point.

Rotation of 90° Counterclockwise	To rotate a figure 90° counterclockwise about the origin, switch the coordinates of each point and then multiply the new first coordinate by −1. (x, y) becomes $(-y, x)$.
Rotation of 180°	To rotate a figure 180° about the origin, multiply both coordinates of each point by −1. (x, y) becomes $(-x, -y)$.

EXAMPLES

A When you rotate the point $A(2, 1)$ 90° counterclockwise about the origin, what are the new coordinates?

Exchange the coordinates to get (1, 2) and then multiply the new first coordinate by −1. The new point is A′(−1, 2).

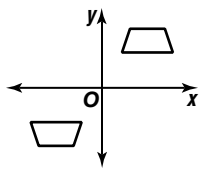
B When you rotate the point $A(2, 1)$ 180° about the origin, what are the new coordinates?

Multiply both coordinates by −1. The new point is A′(−2, −1).

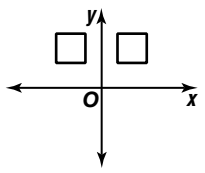
PRACTICE

Determine whether each pair of figures represents a rotation.
***Write* yes *or* no.**

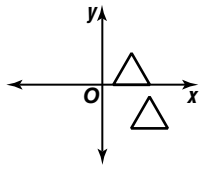
1.



2.



3.



4. Graph triangle ABC with vertices $A(3,-2)$, $B(5,-6)$, and $C(1,-5)$.

a. Rotate the triangle 90° counterclockwise about the origin and graph triangle $A'B'C'$.

b. Rotate the original triangle 180° about the origin and graph triangle $A''B''C''$.

5. **Standardized Test Practice** After a figure is rotated 90° counterclockwise about the origin, its vertices are at (−3, 0), (−2, 3), (−3, 5), and (−4, 3). What were the coordinates of the vertices *before* the rotation?

A (0, 3), (3, 2), (5, 3), (3, 4)

B (0, 3), (−3, 2), (−5, 3), (−3, 4)

C (1, 3), (2, 3), (3, 5), (4, 3)

D (3, 1), (3, 2), (3, 5), (4, 3)

Answers: 1. yes 2. no 3. no 4. See Answer Key. 5. A