NAME_____

Module 11 **Transformation of Shapes**
Lesson 2 **Rotations**

Lesson Notes 11.2

Lesson Objectives

- Perform rotations of two-dimensional figures using a variety of methods.
- Draw and describe the results of rotations about the origin (90° and 180°).

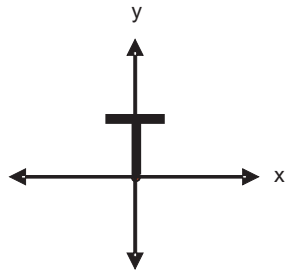
Subtopic 1 Rotations of Two-Dimensional Figures

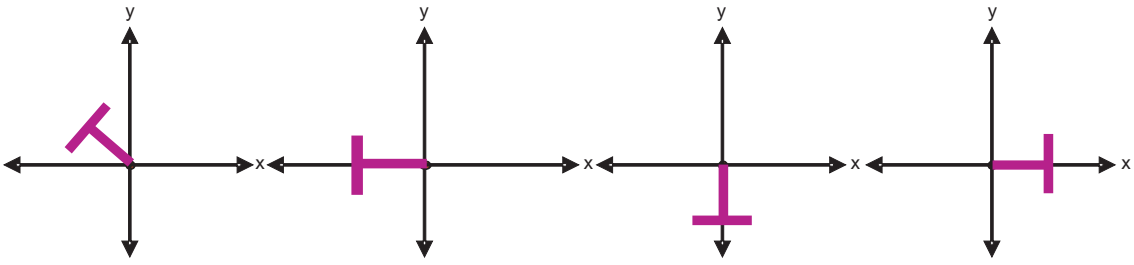
Rotation

- A transformation in which a figure is turned through a **given angle** about a **fixed point**
- The fixed point is called the **center of rotation**.
- The given angle is called the **angle of rotation**.

Unless told otherwise, rotate in a **counterclockwise** direction.

1 Rotate the figure 45°, 90°, 180°, and 270° with the origin as the center of rotation.

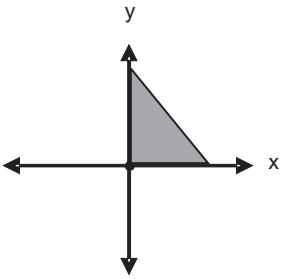


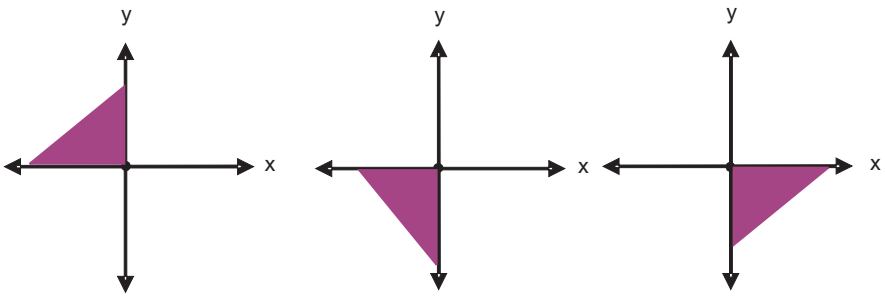


45° **90°** **180°** **270°**

© 2007 BestQuest

2 Rotate the figure 90°, 180°, and 270° with the origin as the center of rotation.





90° **180°** **270°**

Subtopic 2 Rotations Using Ordered Pairs

To rotate a point 90° counterclockwise about the origin:

- Take the opposite of the ***y*-coordinate**.
- **Exchange** the *x*- and *y*-coordinates.
- $(a, b) \rightarrow (-b, a)$

To rotate a point **180°** about the origin:

- Take the opposite of **each coordinate**.
- $(a, b) \rightarrow (-b, -a)$

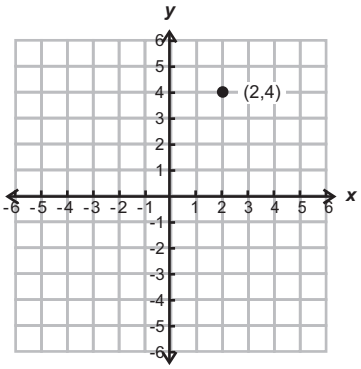
To rotate a point **270°** counterclockwise about the origin:

- Take the opposite of the ***x*-coordinate**.
- Exchange the *x*- and *y*-coordinates.
- $(a, b) \rightarrow (b, -a)$

© 2007 BestQuest

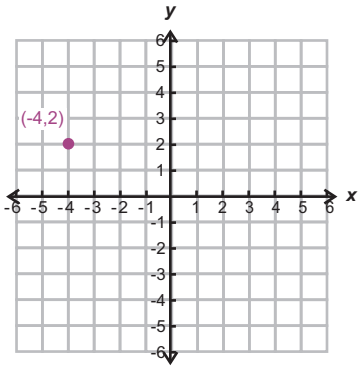
NAME_____

Module 11 **Transformation of Shapes**
Lesson 2 **Rotations**

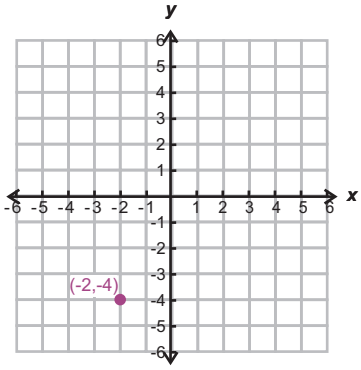


3 Rotate the point (2, 4) around the origin 90°, 180°, and 270°.

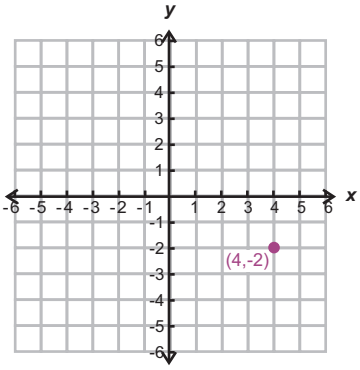
90°: (2, 4) → (-4, 2)
180°: (2, 4) → (-2, -4)
270°: (2, 4) → (4, -2)



90°



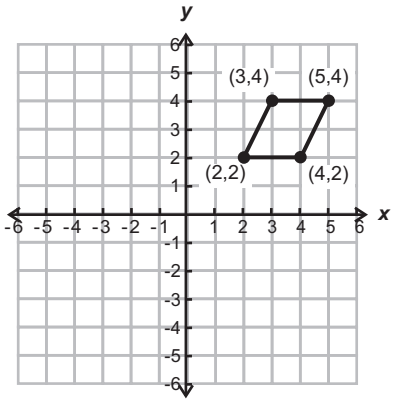
180°

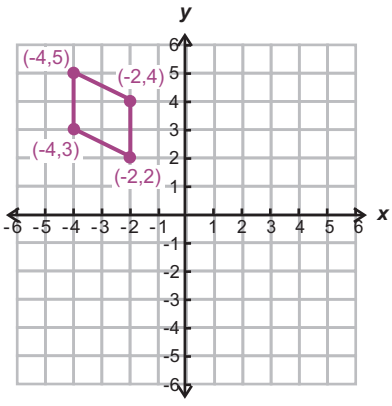


270°

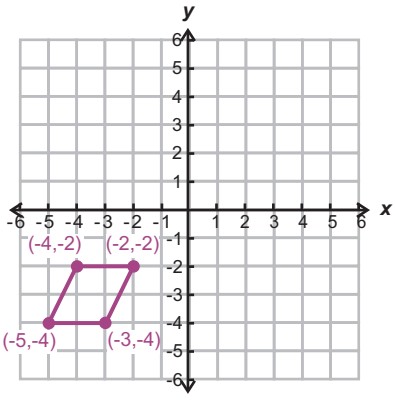
4 Rotate the parallelogram around the origin 90° and 180°.

90°: (*a*, *b*) → (-*b*, *a*)
180°: (*a*, *b*) → (-*a*, -*b*)





90°



180°

© 2007 BestQuest