8.7 Graphing Rotations

Quick Review

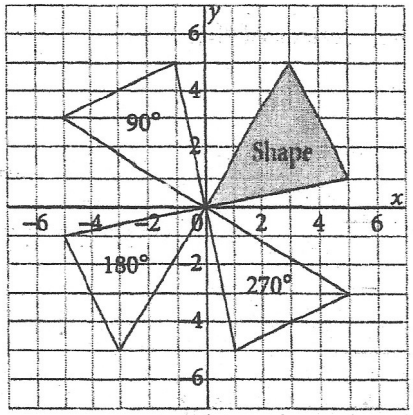
At Home / At School

- A rotation turns a shape about a point of rotation.
- Rotations can be clockwise or counterclockwise.
  A counterclockwise rotation is positive.
  A clockwise rotation is negative.
- You can use tracing paper to draw the images of a shape after a 90°, 180°, or 270° rotation about the origin on a coordinate grid.
  - Trace the original shape and the axes.
  - Label the positive y-axis on the tracing paper.
  - Place a pencil point at the origin. Rotate the tracing paper counterclockwise until the positive y-axis coincides with the given axis.

Rotation	Positive y-axis coincides with . . .
90°	negative x-axis
180°	negative y-axis
270°	positive x-axis

  - Mark the vertices of the image with a sharp pencil through the tracing paper.
  - Join the vertices to draw the image of the original shape.

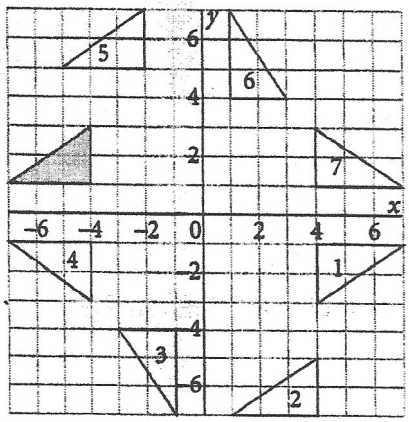
This diagram shows the images of a shape after rotations of 90°, 180°, and 270° about the origin.



- Each image is congruent to the original shape.

Practice

1. Match the image with each transformation of the original shaded triangle.



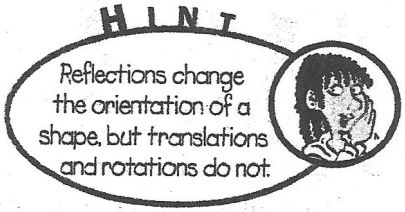
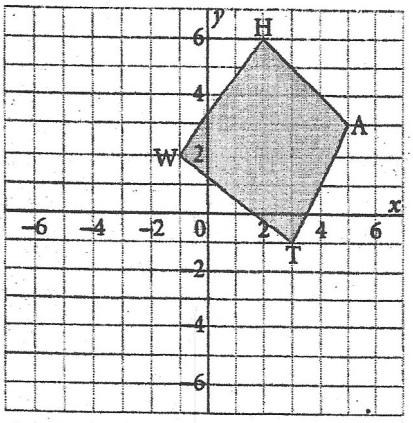


Image	Transformation of Original Triangle
1	rotation of 90° counterclockwise about the origin
2	reflection in the x-axis
3	translation 2 units right and 4 units up
4	reflection in the y-axis
5	rotation of 180° about the origin
6	rotation of 90° clockwise about the origin
7	translation 8 units right and 8 units down

2. **a)** Draw the image of quadrilateral WHAT after a rotation of 90° about the origin.

b) Write the coordinates of the vertices of the original shape and its image.



W_____ → W′_____

H_____ → H′_____

A_____ → A′_____

T_____ → T′_____

What pattern do you see in the coordinates?

_____

_____

3. a) Draw the image of quadrilateral WHAT after a rotation of 180° about the origin on the coordinate grid in question 2.

b) Write the coordinates of the vertices of the original shape and its image.

W_____ → W″_____

H _____ → H″_____

A _____ → A″_____

T _____ → T″_____

What pattern do you see in the coordinates?

_____

_____

4. a) Draw the image of quadrilateral WHAT after a rotation of –90° about the origin on the coordinate grid in question 2.

b) Write the coordinates of the vertices of the original shape and its image.

> **Tip**
> *A clockwise rotation is shown by a negative angle. A rotation of –90° is the same as a rotation of 270°.*

W_____ → W‴_____

H _____ → H‴_____

A _____ → A‴_____

T _____ → T‴_____

What pattern do you see in the coordinates?

_____

_____

5. Use the patterns from questions 2 to 4 to predict the coordinates of the image of K(–5, 1):

a) after a rotation of 90° about the origin. _____

b) after a rotation of 180° about the origin. _____

c) after a rotation of 270° about the origin. _____

6. Write the coordinates of the vertices of the image of △ABC after a rotation of 90° about the origin.

A(3, 2) → A′_____ B(5, –4) → B′_____ C(–6, –1) → C′_____