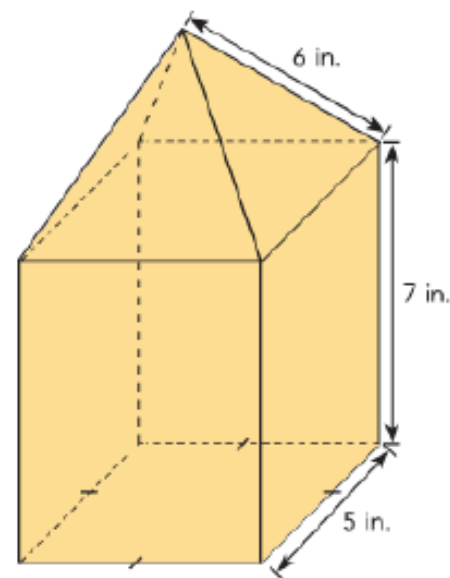
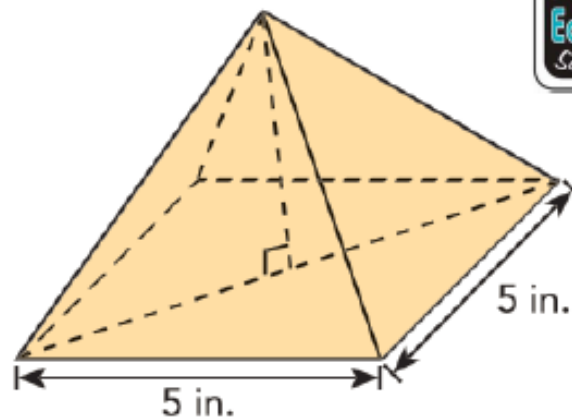


Week 8 Tuesday Course 3 Warm-up

Find the height of the pyramid in inches



Week 8 Tuesday Course 3 Warm-up



Let h represent the height of the pyramid in inches.

$$6^2 = h^2 + \left(\frac{\sqrt{50}}{2}\right)^2$$

Use the Pythagorean Theorem.

$$36 = h^2 + 12.5$$

Multiply.

$$36 - 12.5 = h^2 + 12.5 - 12.5$$

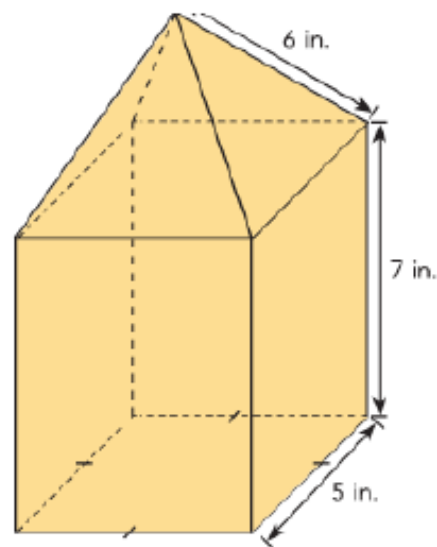
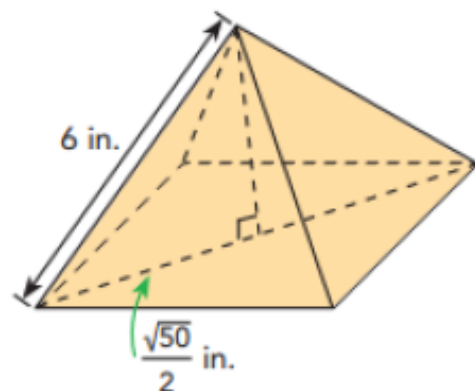
Subtract 12.5 from both sides.

$$23.5 = h^2$$

Simplify.

$$h = \sqrt{23.5}$$

Find the positive square root.



Lesson 8.3 Rotations Day 2

Objective

TSW understand concept of rotation

*drawing images after rotation

*find coordinates of points after rotation

Common Core State Standards

8G1 Verify experimentally the properties of rotations, reflections, and translations.

8G1 c Parallel lines are taken to parallel lines

Mathematical Practices *MP3 Construct arguments MP 4 Model Mathematics MP5 Use tools strategically*



▶ Geometric transformations move figures about on a plane. Each type of transformation changes some properties of a figure, but leaves other properties unchanged.

Lesson 8.3 Rotations Day 2

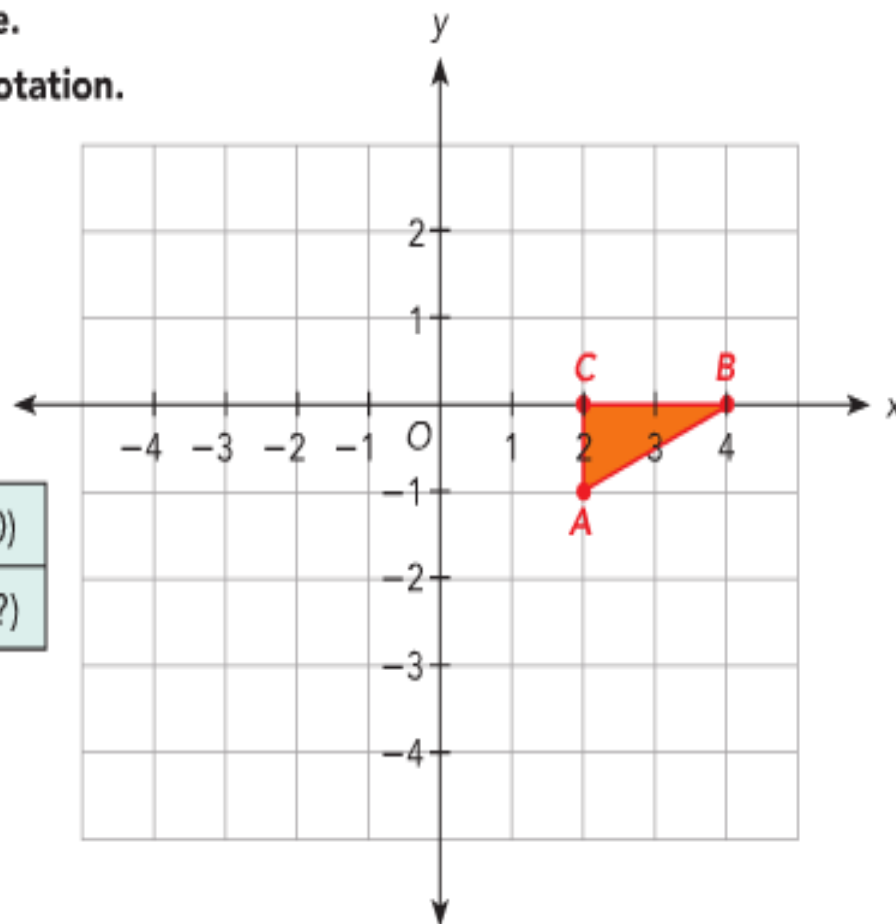
Example 12 Draw images after rotations about the origin.

Triangle ABC is shown on the coordinate plane.

Draw and label the image $A'B'C'$ under each rotation.

Then complete the table of coordinates.

A triangular flag ABC is connected to a rotating shaft. The shaft is positioned at the origin, O .



Original Point	$A(2, -1)$	$B(4, 0)$	$C(2, 0)$
Is Mapped Onto	$A'(? , ?)$	$B'(? , ?)$	$C'(? , ?)$

- a) 90° clockwise about the origin, O

Solution

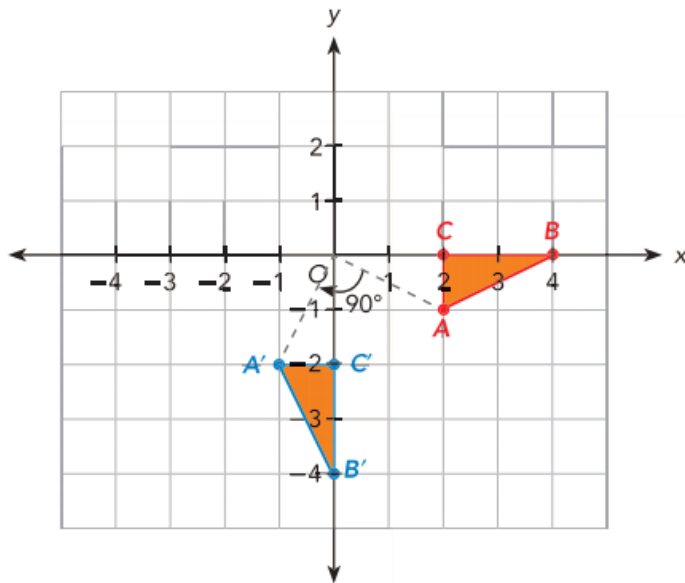
The steps to rotate point A are as follows:

STEP 1 Join O to A.

STEP 2 With O as the center, measure 90° clockwise from \overline{OA} .

STEP 3 Mark A' such that $OA' = OA$.

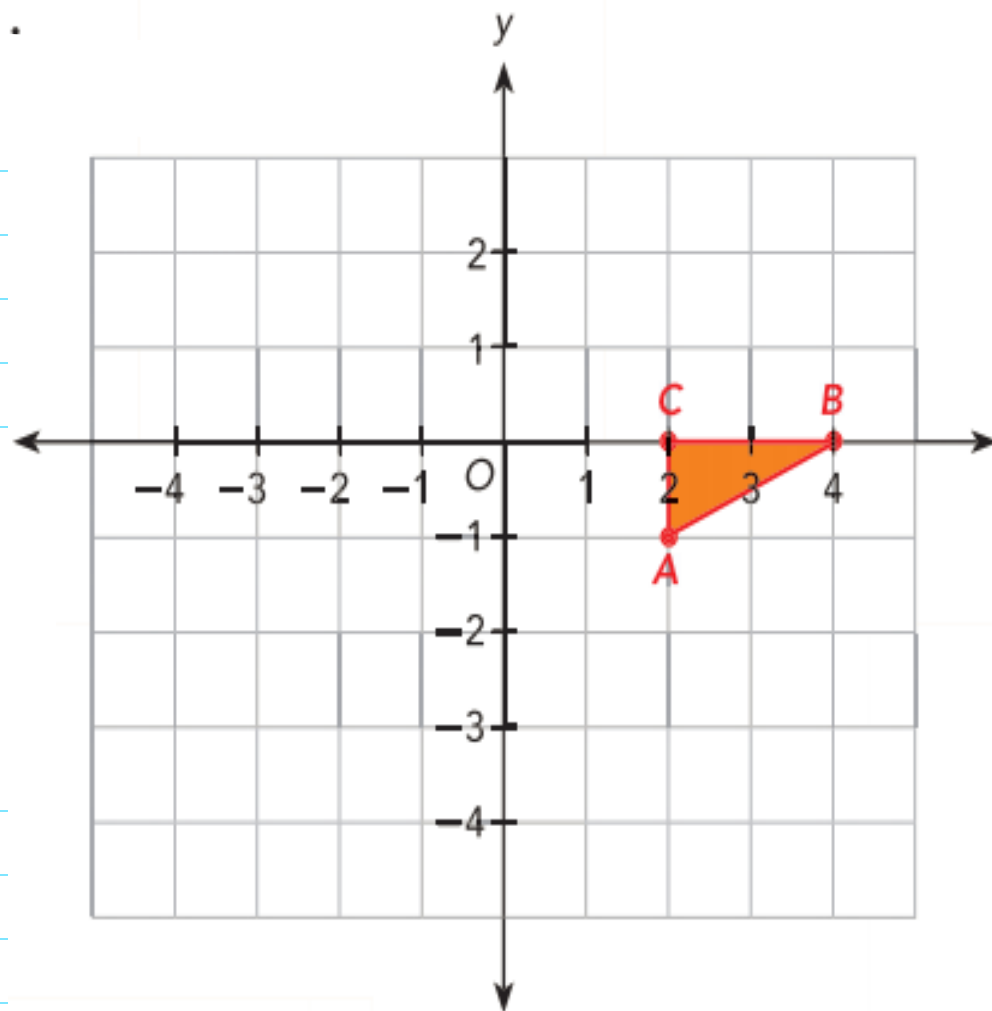
STEP 4 Repeat the steps for points B and C to locate the images B' and C' .
Join the points to complete the image.



Original Point	A (2, -1)	B (4, 0)	C (2, 0)
Is Mapped Onto	A' (-1, -2)	B' (0, -4)	C' (0, -2)

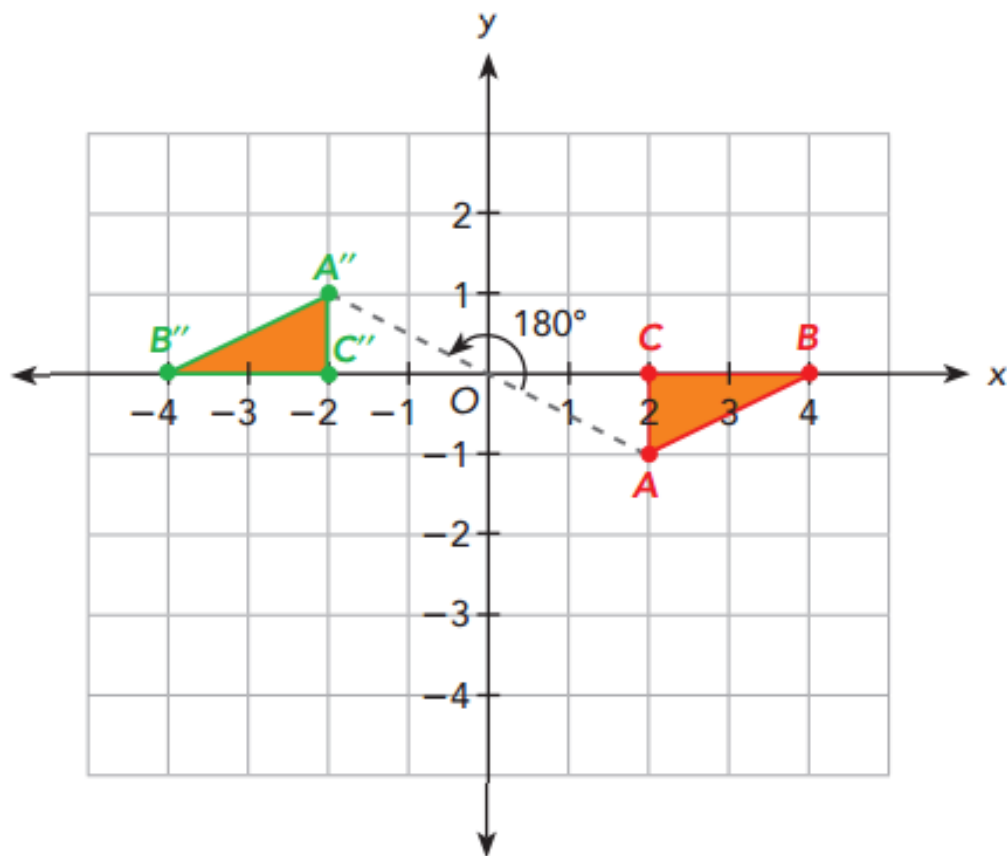
b) 180° about the origin, O

Original Point	$A (2, -1)$	$B (4, 0)$	$C (2, 0)$
Is Mapped Onto	$A'' (? , ?)$	$B'' (? , ?)$	$C'' (? , ?)$



b) 180° about the origin, O

Solution



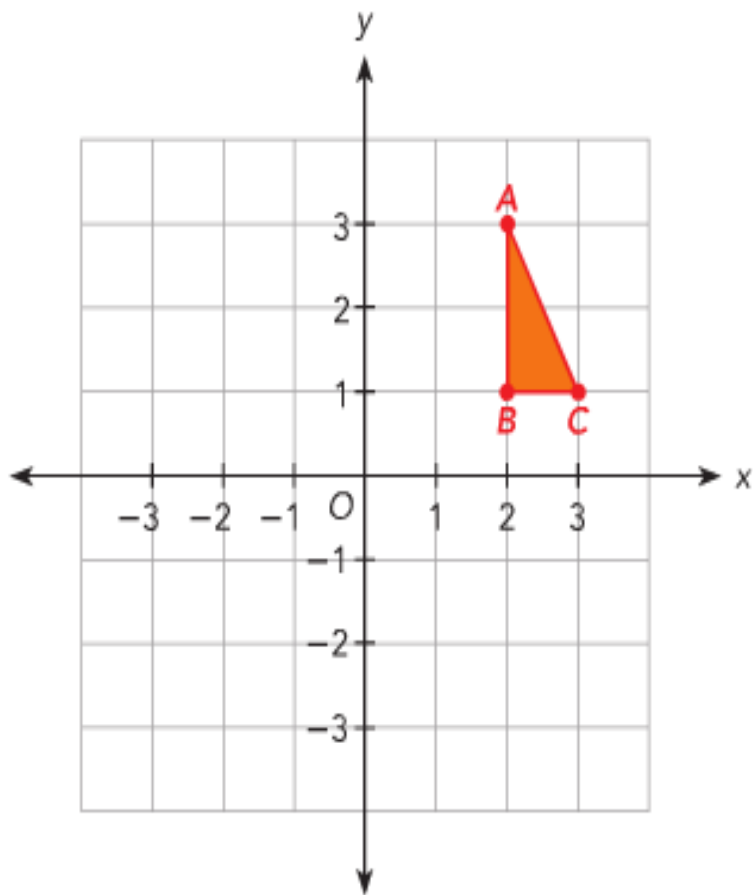
Follow the steps in a) using 180° as the angle of rotation.

Original Point	A (2, -1)	B (4, 0)	C (2, 0)
Is Mapped Onto	A'' (-2, 1)	B'' (-4, 0)	C'' (-2, 0)

Guided Practice

Copy and complete on graph paper.

- 4 A rotation of $\triangle ABC$ 90° clockwise about the origin, O , produces the image $\triangle A'B'C'$. Draw and label the image $\triangle A'B'C'$.



Original Point	Is Mapped Onto
A (2, 3)	A' (___, ___)
B (2, 1)	B' (___, ___)
C (3, 1)	C' (___, ___)

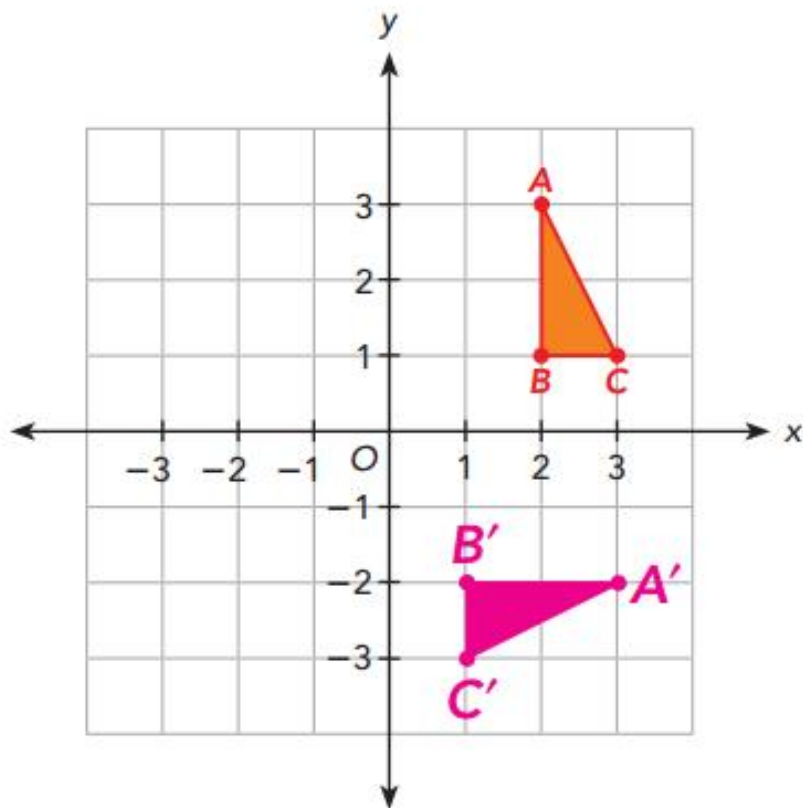
$\triangle ABC$ is read as "triangle ABC."



Guided Practice

Copy and complete on graph paper.

- 4 A rotation of $\triangle ABC$ 90° clockwise about the origin, O , produces the image $\triangle A'B'C'$. Draw and label the image $\triangle A'B'C'$.



Original Point	Is Mapped Onto
A (2, 3)	A' (___, ___)
B (2, 1)	B' (___, ___)
C (3, 1)	C' (___, ___)

3; -2

1; -2

1; -3

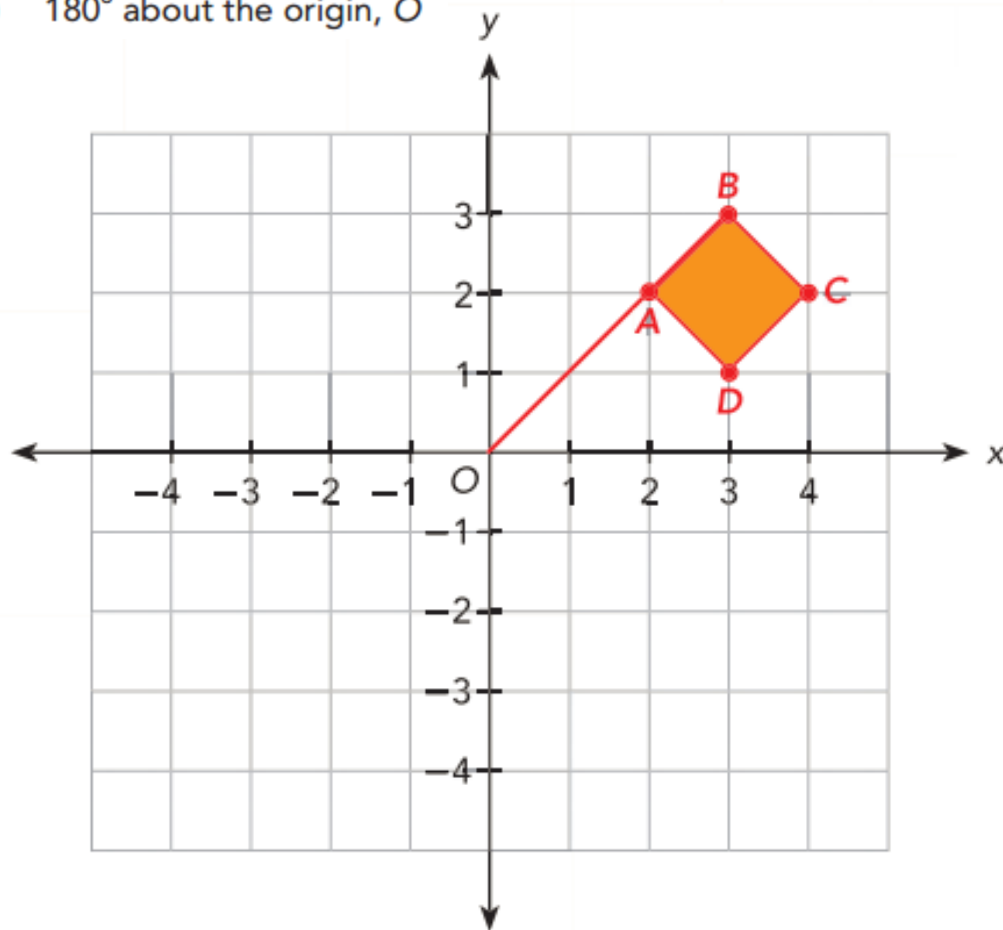
$\triangle ABC$ is read as
"triangle ABC."



Example 13 Find the coordinates of points after rotations.

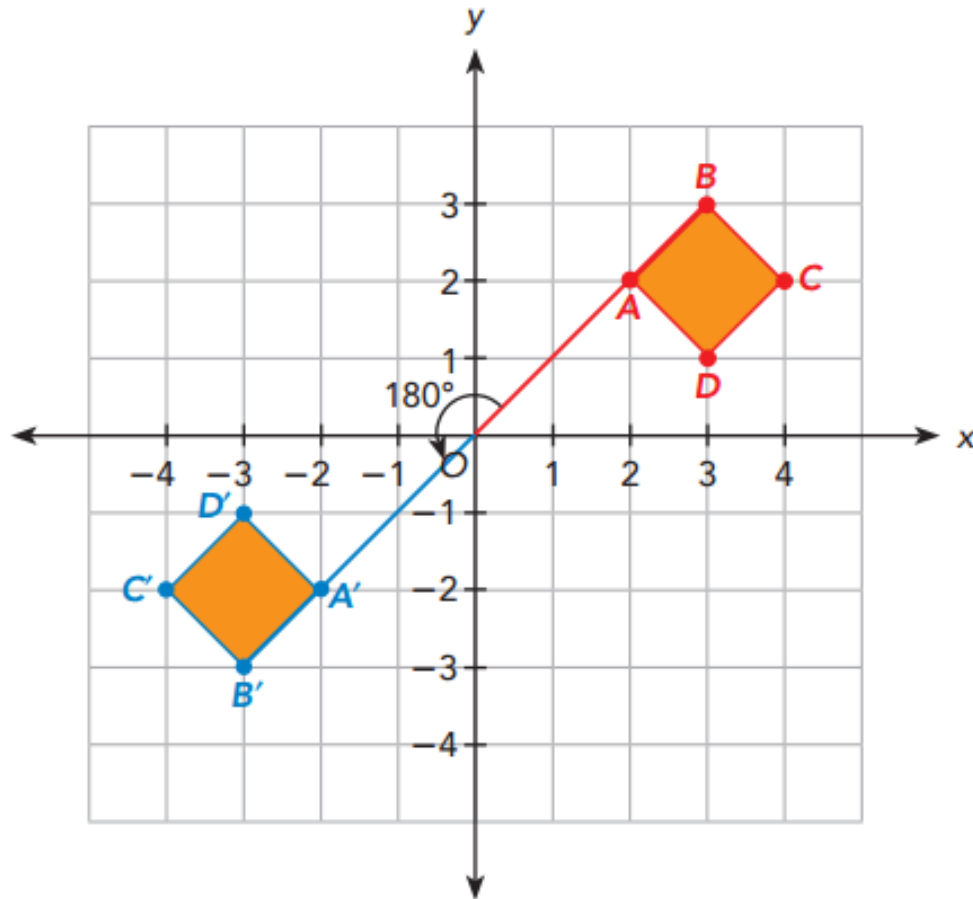
A rod is rotating counterclockwise about the origin, O . A square flag is connected to the rotating rod. The position of the flag is at $A(2, 2)$, $B(3, 3)$, $C(4, 2)$, and $D(3, 1)$ as shown. Find the coordinates of the image under each angle of rotation.

- a) 180° about the origin, O



a) 180° about the origin, O

Solution



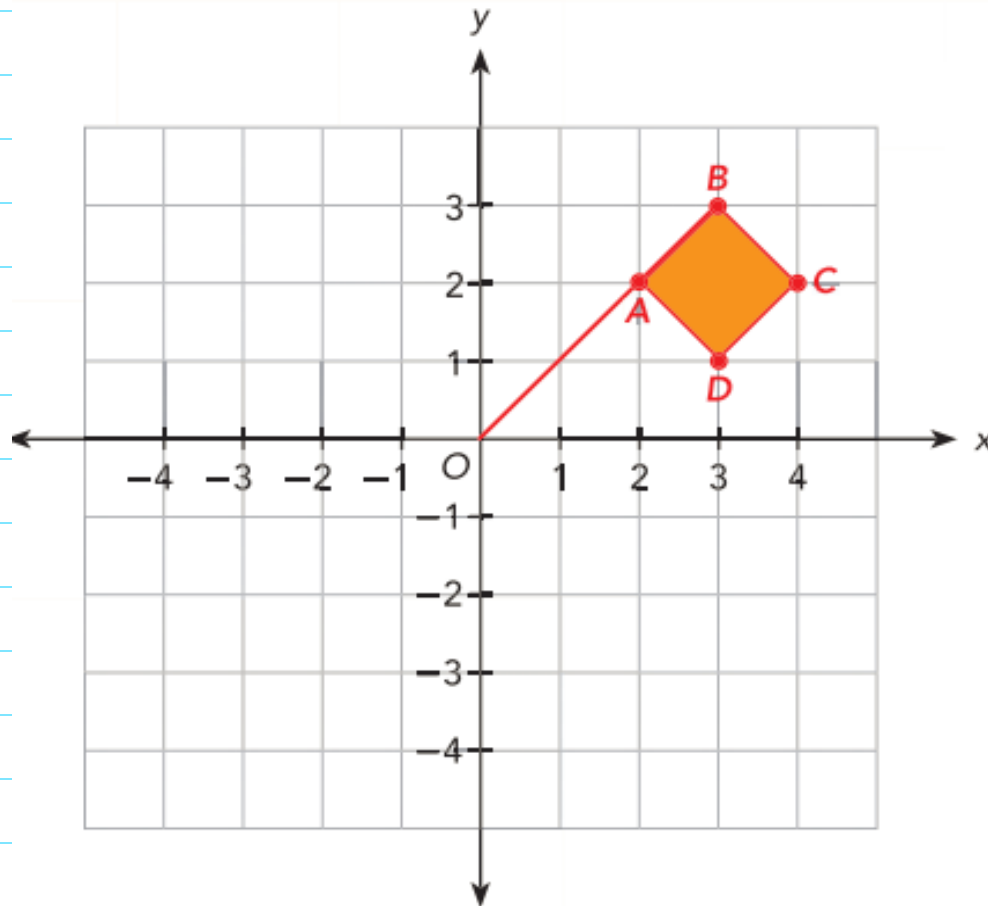
Original Point	Is Mapped Onto
A (2, 2)	A' (-2, -2)
B (3, 3)	B' (-3, -3)
C (4, 2)	C' (-4, -2)
D (3, 1)	D' (-3, -1)

Notice that a point $P(x, y)$ when rotated 180° about the origin is mapped onto the point $P'(-x, -y)$.



Lesson 8.3 Rotations Day 2

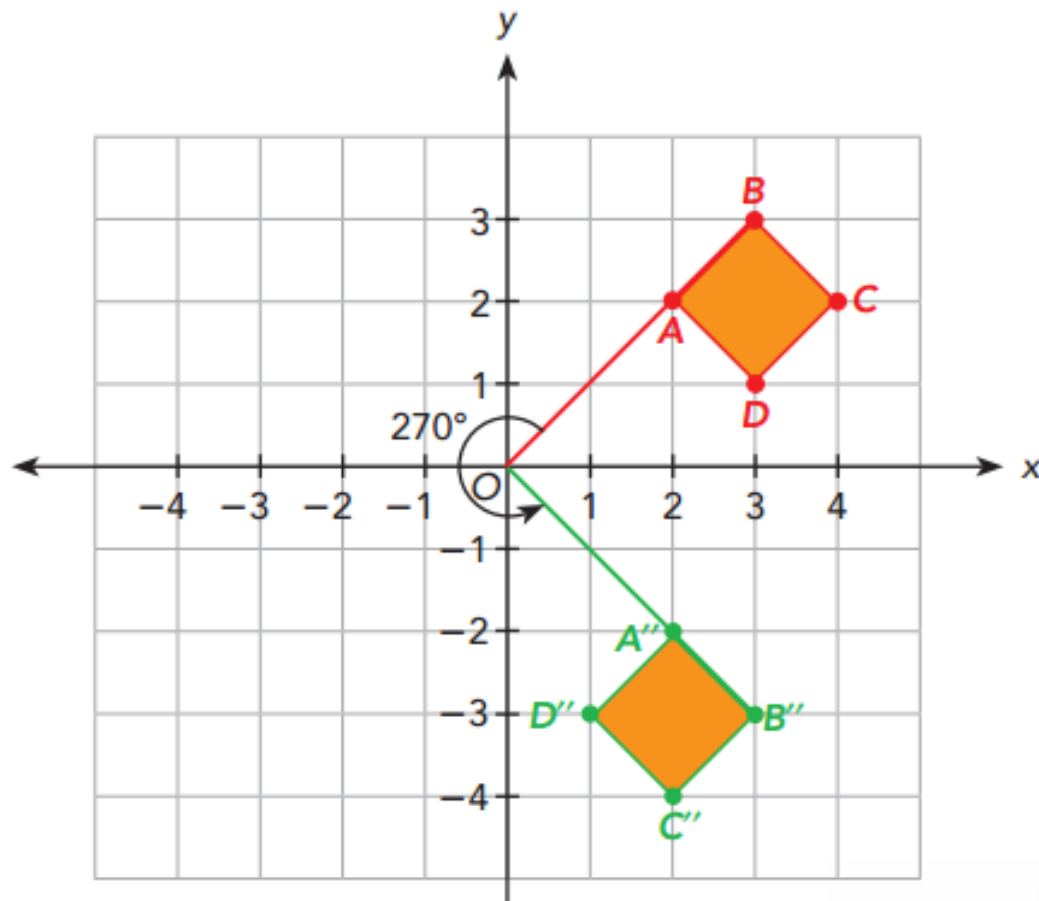
b) 270° counterclockwise about the origin, O



Lesson 8.3 Rotations Day 2

b) 270° counterclockwise about the origin, O

Solution



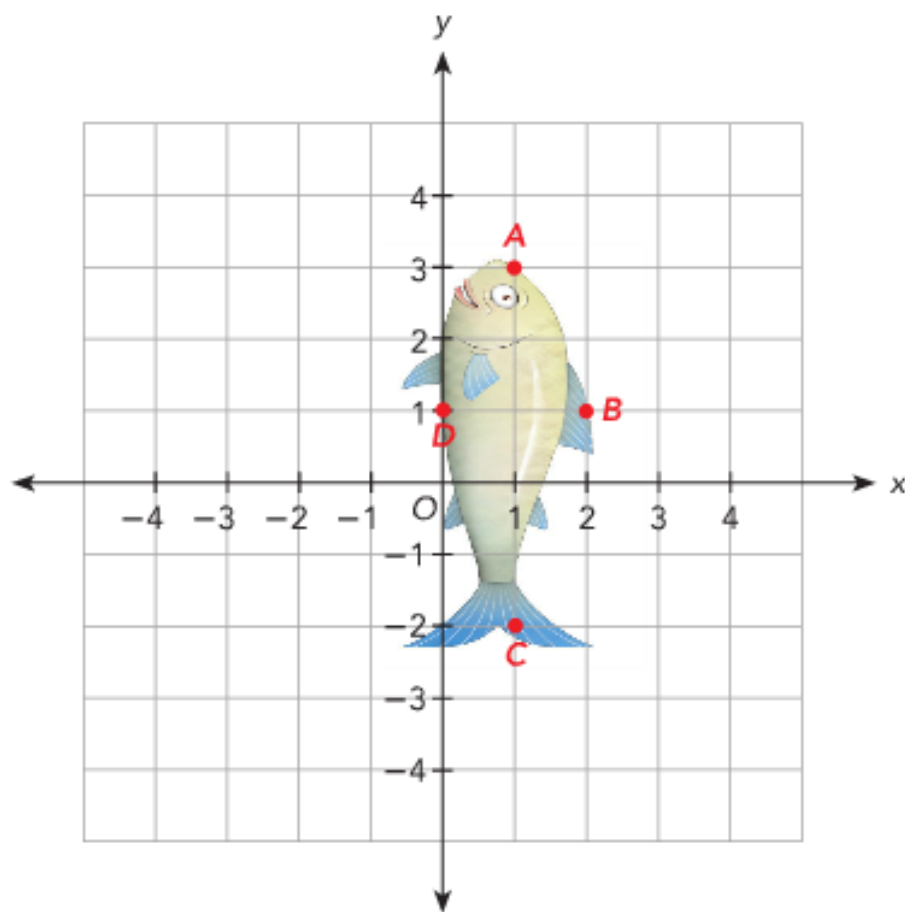
Original Point	Is Mapped Onto
A (2, 2)	A'' (2, -2)
B (3, 3)	B'' (3, -3)
C (4, 2)	C'' (2, -4)
D (3, 1)	D'' (1, -3)



Guided Practice

Copy and complete on graph paper.

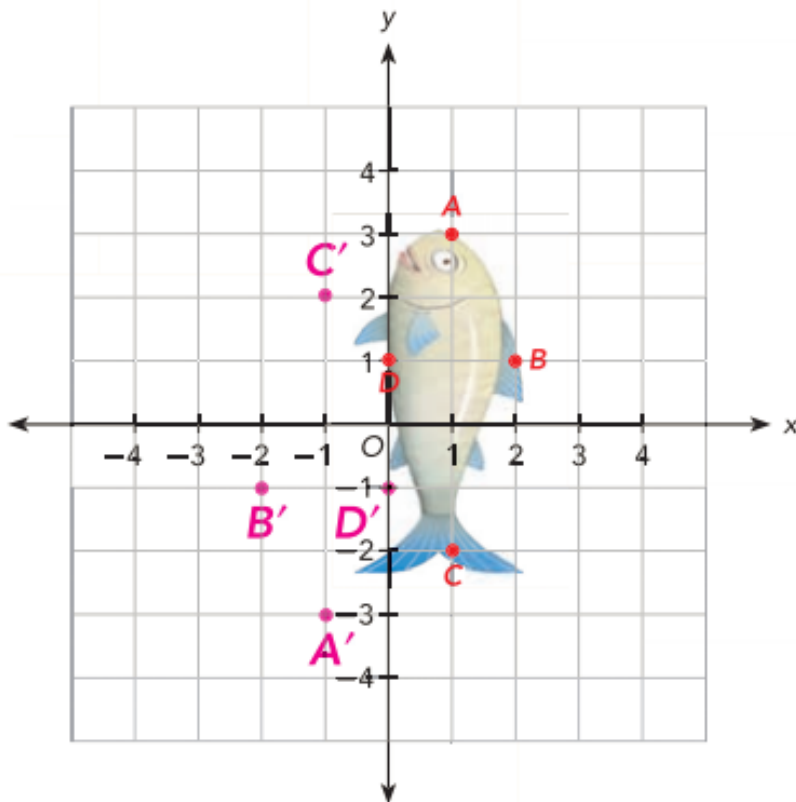
- 5 An animation artist draws a fish on the coordinate plane and marks the points A , B , C , and D . Then the artist rotates the fish 180° about the origin, O . Complete the table of coordinates to show the coordinates of the image points A' , B' , C' , and D' .



Original Point	Is Mapped Onto
$A (1, 3)$	$A' (\underline{\quad ? \quad}, \underline{\quad ? \quad})$
$B (2, 1)$	$B' (\underline{\quad ? \quad}, \underline{\quad ? \quad})$
$C (1, -2)$	$C' (\underline{\quad ? \quad}, \underline{\quad ? \quad})$
$D (0, 1)$	$D' (\underline{\quad ? \quad}, \underline{\quad ? \quad})$

Lesson 8.3 Rotations Day 2

- 5 An animation artist draws a fish on the coordinate plane and marks the points A , B , C , and D . Then the artist rotates the fish 180° about the origin, O . Complete the table of coordinates to show the coordinates of the image points A' , B' , C' , and D' .



Original Point	Is Mapped Onto
$A(1, 3)$	$A'(\underline{\quad}, \underline{\quad})$
$B(2, 1)$	$B'(\underline{\quad}, \underline{\quad})$
$C(1, -2)$	$C'(\underline{\quad}, \underline{\quad})$
$D(0, 1)$	$D'(\underline{\quad}, \underline{\quad})$

$-1; -3$

$-2; -1$

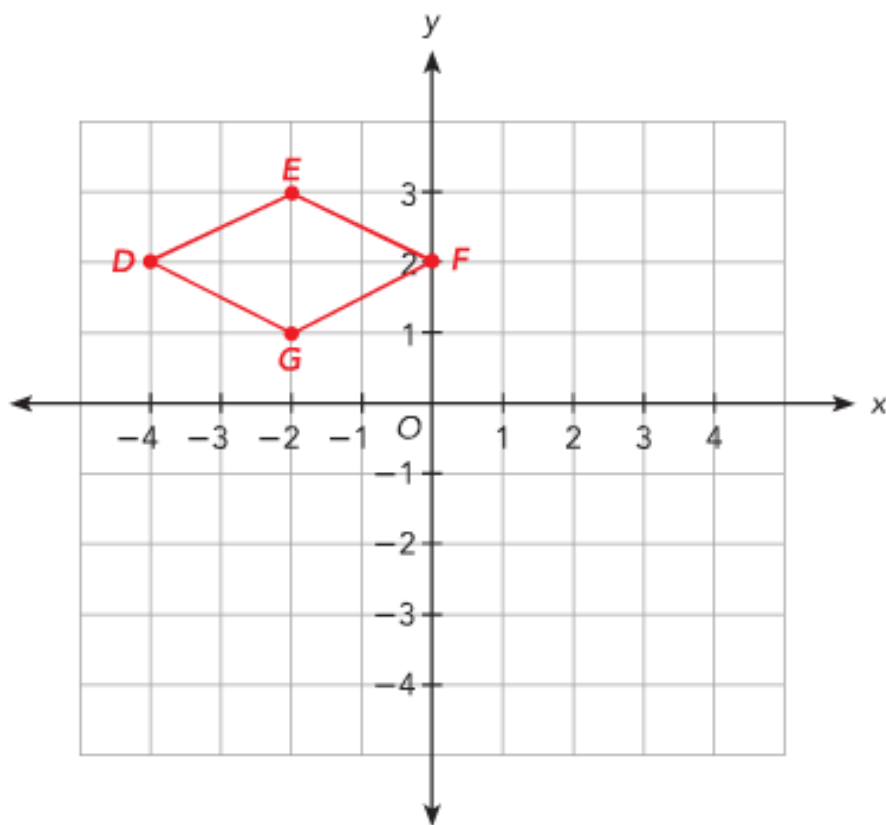
$-1; 2$

$0; -1$

Lesson 8.3 Rotations Day 2

6 $DEFG$ is rotated 90° counterclockwise about O .

- Draw and label the image $D'E'F'G'$.
- Complete the table of coordinates for $DEFG$ and its image $D'E'F'G'$.

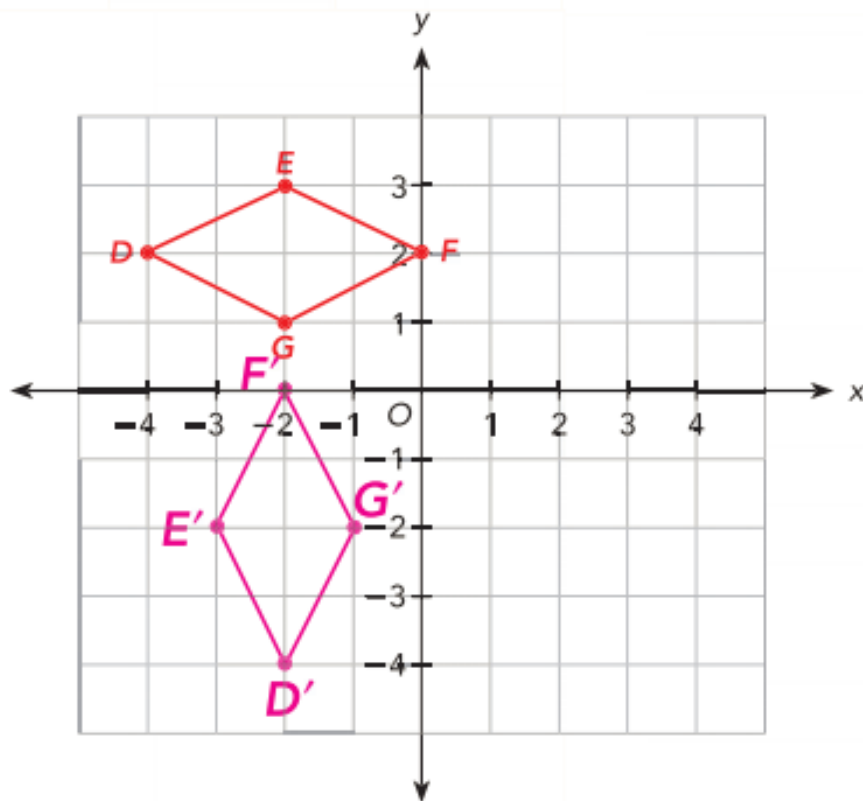


Original Point	Is Mapped Onto
$D(-4, 2)$	$D'(\underline{\quad?}, \underline{\quad?})$
$E(-2, 3)$	$E'(\underline{\quad?}, \underline{\quad?})$
$F(0, 2)$	$F'(\underline{\quad?}, \underline{\quad?})$
$G(-2, 1)$	$G'(\underline{\quad?}, \underline{\quad?})$

Lesson 8.3 Rotations Day 2

6 $DEFG$ is rotated 90° counterclockwise about O .

- Draw and label the image $D'E'F'G'$.
- Complete the table of coordinates for $DEFG$ and its image $D'E'F'G'$.



Original Point	Is Mapped Onto
$D(-4, 2)$	$D'(\underline{\quad?}, \underline{\quad?})$
$E(-2, 3)$	$E'(\underline{\quad?}, \underline{\quad?})$
$F(0, 2)$	$F'(\underline{\quad?}, \underline{\quad?})$
$G(-2, 1)$	$G'(\underline{\quad?}, \underline{\quad?})$

$-2; -4$

$-3; -2$

$-2; 0$

$-1; -2$

Lesson 8.3 Rotations Day 2

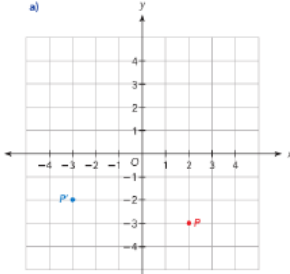
Practice 8.3 #4-7

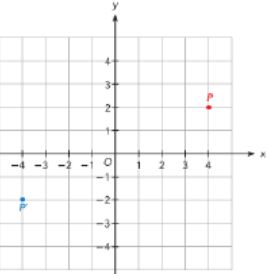
Name: _____ Date: _____

Practice 8.3

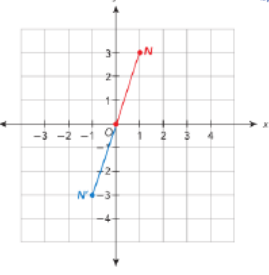
Solve. Show your work.

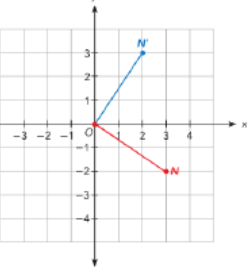
1 A rotation of point P clockwise about O maps onto P' . State the angle of rotation.

a) 

b) 

2 \overline{ON} is rotated about the origin, O , to form the image $\overline{ON'}$. State the angle and direction of each rotation.

a) 

b) 

Course 3

Challenge-

*Solve created equations

“Pick a Snowflake”

*BuzzMath



Lesson Check #1 & 4- can rotate a figure and find the coordinates after 90 and 180 degree rotation

Lesson 8.3 Rotation Day 2

Ticket Out the Door- Connect, Extend, Challenge

1. How are the ideas and information presented **CONNECTED** to what you already knew?
2. What new ideas did you get that **EXTENDED** or pushed your thinking in new directions?
3. What is still **CHALLENGING** or confusing for you to get your mind around? What questions, wonderings or puzzles do you now have?