

Objective: The students will complete assignment 17.3 Rotations and will demonstrate their understanding with an accuracy rate of 70% or higher on Quiz-19 tomorrow.*

Standards


G-CO. Experiment with transformations in the plane.

Mathematics I

WHAT DO YOU NEED?

 A working *Chromebook*

 Math Notebook 

 **17.3 Rotations - Class & Homework**

 **TURN IN LATE OR MISSING WORK**

**If accuracy of 70% or higher is not achieved, the student(s) will be required to retake it.*



Rules for Rotations Around the Origin on a Coordinate Plane

90° rotation counterclockwise	$(x, y) \rightarrow (-y, x)$
180° rotation	$(x, y) \rightarrow (-x, -y)$
270° rotation counterclockwise	$(x, y) \rightarrow (y, -x)$
360° rotation	$(x, y) \rightarrow (x, y)$

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17.3 Rotations - Class & Homework

17.3



Suppose you are given a figure and a center of rotation P . Complete the descriptions of two different ways you can use a ruler and protractor to draw the image of the figure after a 195° counterclockwise rotation around P .

$$360^\circ - 195^\circ = 165^\circ$$

Method 1: Use the ruler and protractor to draw a 165° clockwise rotation of the figure.

$$195^\circ - 180^\circ = 15^\circ$$

Method 2: First draw a 180° counterclockwise rotation of the figure. Then draw a 15° counterclockwise rotation of the image.

2

Determine whether each statement about the rotation $(x, y) \rightarrow (y, -x)$ is true or false. Select True or False for each statement.

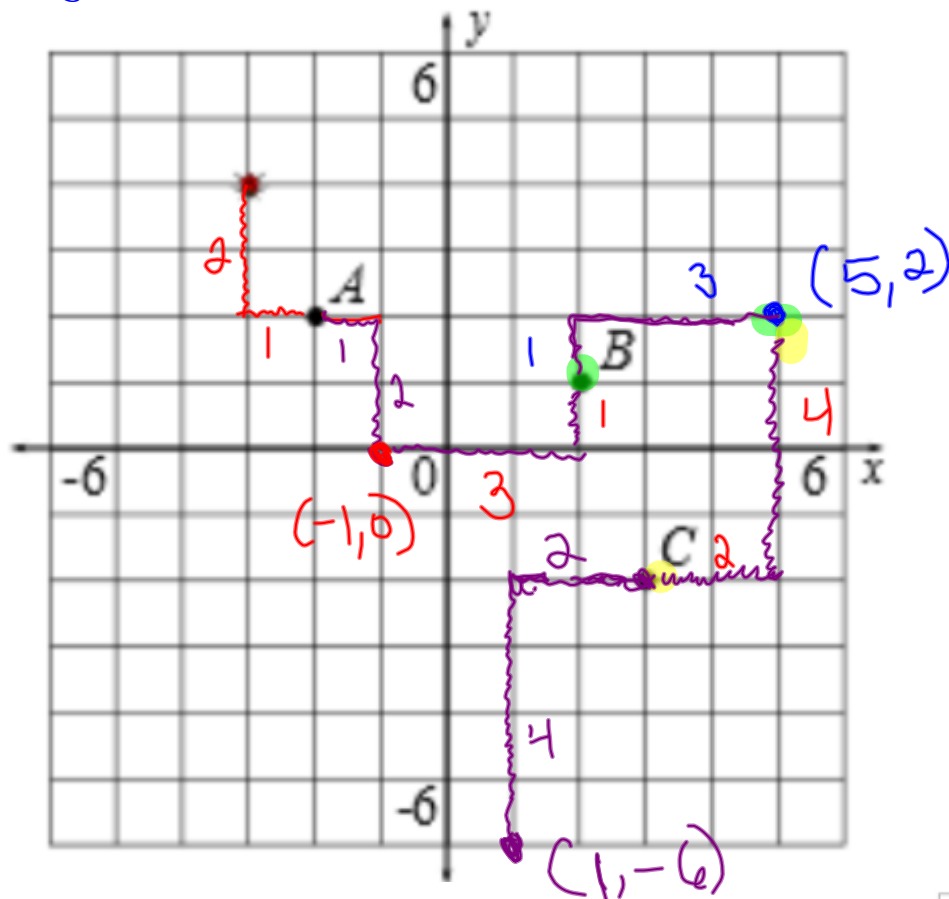
270° rotation counterclockwise

$$(x, y) \rightarrow (y, -x)$$

Statement	True	False
Every point in Quadrant III is mapped to a point in Quadrant IV.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Points on the x -axis are mapped to points on the y -axis.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The origin is fixed under the rotation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The rotation has the same effect as a 90° clockwise rotation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The angle of rotation is 180°.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A point on the line $y = x$ is mapped to another point on the line $y = x$.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3

An animator is drawing a scene in which a ladybug moves around three mushrooms. The figure shows the starting position of the ladybug. The animator rotates the ladybug 180° around mushroom A, then 180° around mushroom B, and finally 180° around mushroom C. What are the final coordinates of the ladybug?



The final coordinates of the ladybug are (,)

4

A tower has a revolving restaurant 715 feet above the ground. The restaurant makes a complete revolution every 45 minutes. While a visitor was at the tower, the restaurant rotated through 168°. How long was the visitor at the tower?

The tower rotates through 360° in 45 minutes. Let x be the number of minutes the visitor was at the tower. Set up a proportion.

$$\frac{x}{45} = \frac{168}{360}$$

$$360x = 45 \cdot 168$$

$$\frac{360x}{360} = \frac{7560}{360}$$

$$x = 21$$

The visitor was at the tower for minutes.



5

A Ferris wheel has 15 cars that are equally spaced around the circumference of the wheel. The wheel rotates so that the car at the bottom of the ride is replaced by the next car. By how many degrees does the wheel rotate?

$$360^\circ \div 15 = 24^\circ$$



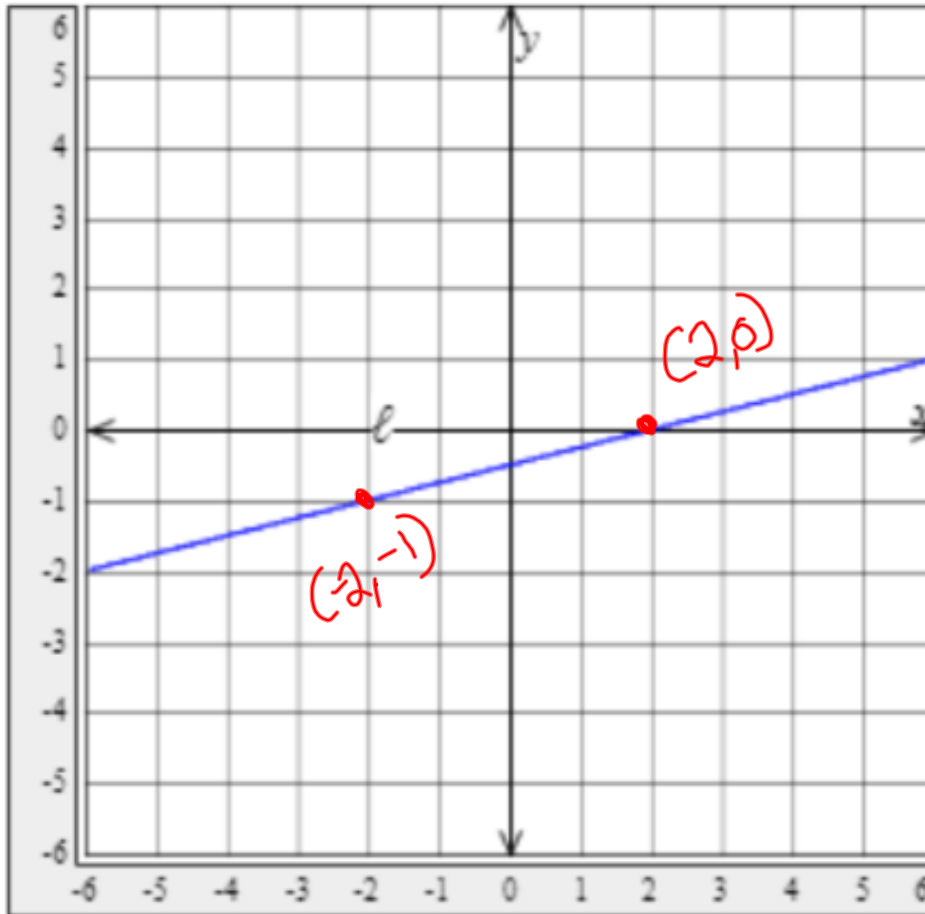
© Can Stock Photo - csp16427502

The Ferris wheel rotates ° between successive cars being at the bottom.

6

Enter the slope-intercept equation for the image of line ℓ after a clockwise rotation of 90° . (Hint: To find the image of line ℓ , choose two or more points on the line and find the images of the points.)

90° rotation counterclockwise $(x, y) \rightarrow (-y, x)$



Pick two points on the line ℓ , that is passes through $A(-2, -1)$ and $B(2, 0)$.

Rotate the points to $A'(-1, 2)$ and $B'(0, -2)$

Find the slope

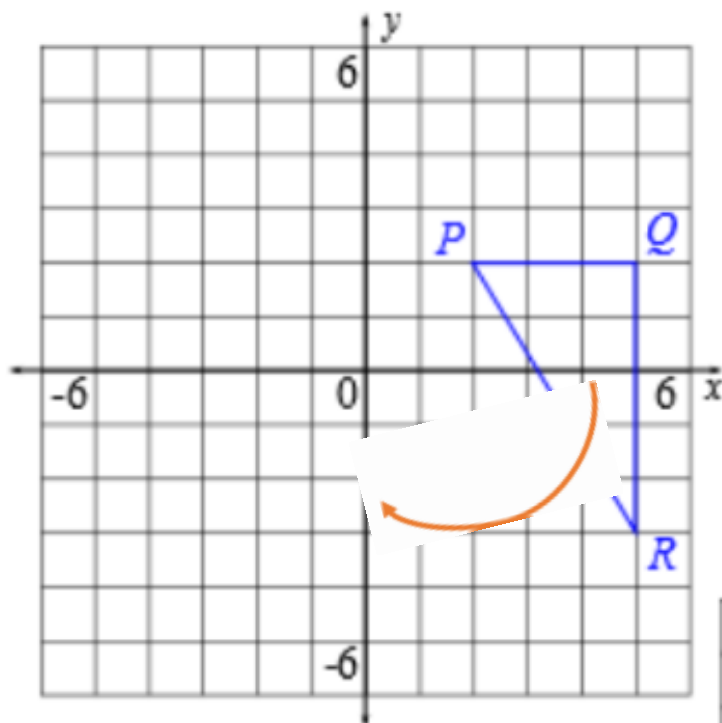
$$m = \frac{B'_y - A'_y}{B'_x - A'_x} = \frac{-2 - 2}{0 - (-1)} = -4$$

the point-slope formula

$$y - (-2) = -4(x - (0))$$

and solve for y .

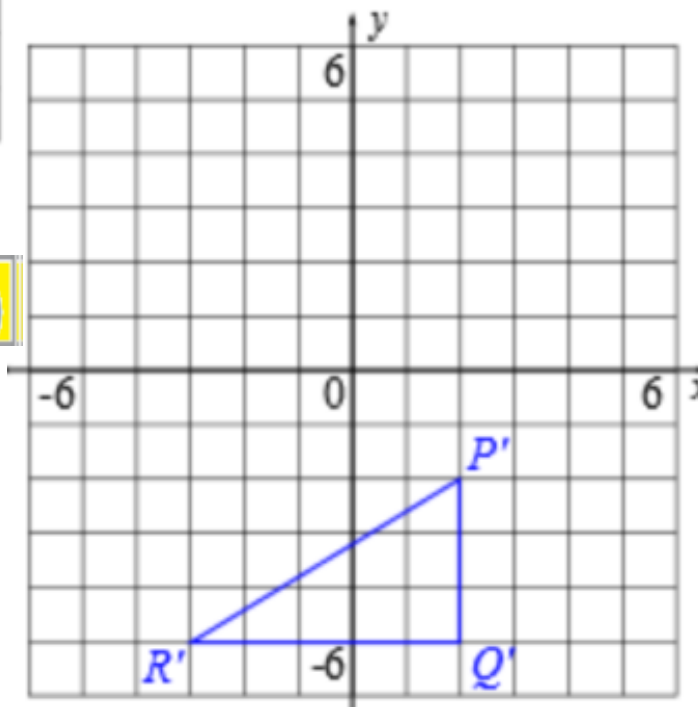
$$y = -4x - 2$$

7

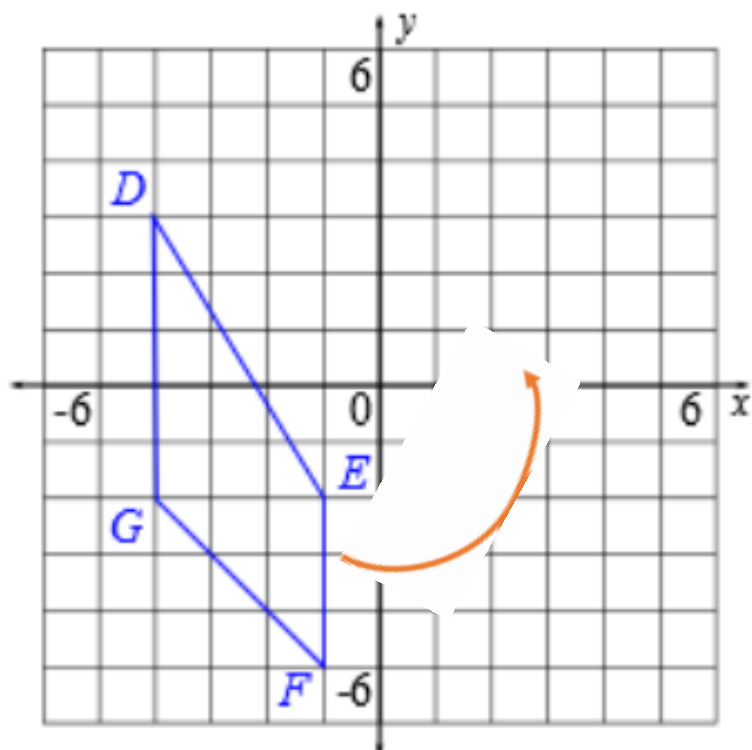
Select the image of the figure under a rotation of 90° about the origin.

Negative 90° is same as 270° counterclockwise

270° rotation counterclockwise $(x, y) \rightarrow (y, -x)$



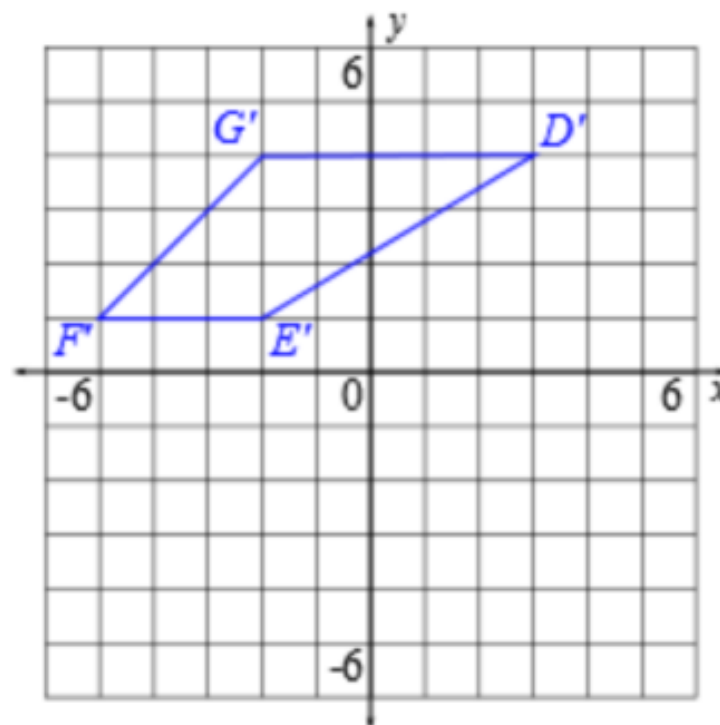
8



Select the image of the figure after a rotation of 270° about the origin.

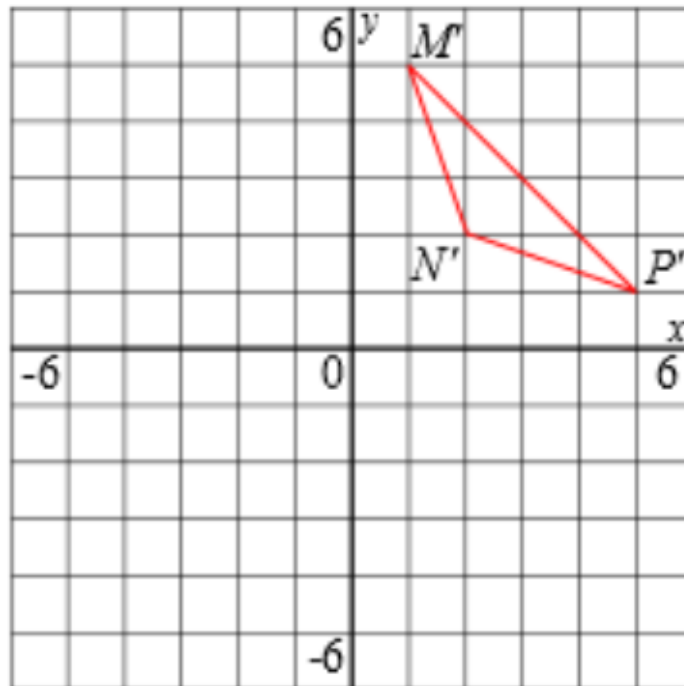
Rotate 3-Quadrate

270° rotation counterclockwise $(x, y) \rightarrow (y, -x)$



9

The figure shows the image of $\triangle MNP$ after a counterclockwise rotation of 90° . Select the figure showing $\triangle MNP$.



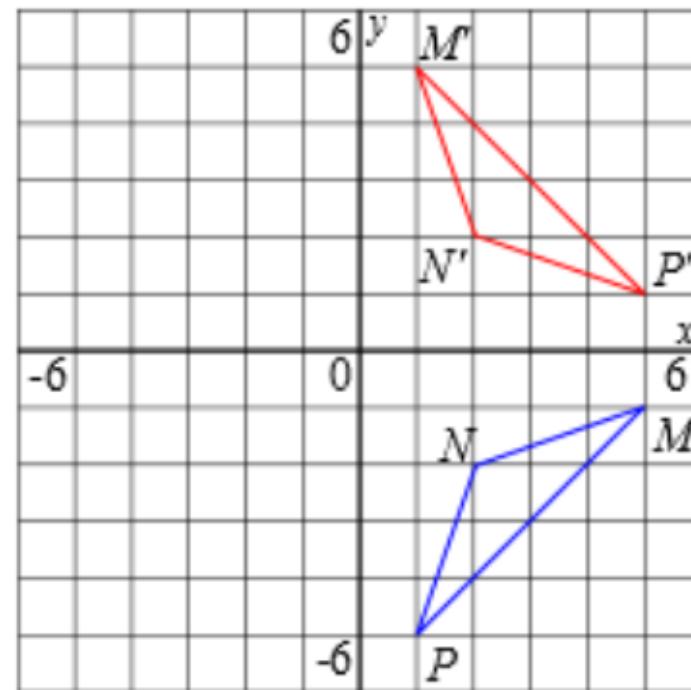
90° rotation counterclockwise $(-y, x) \rightarrow (x, y)$

- * Keep y same, but put in place of x
- * Switch sign on x , put in place of y .

$M'(1, 5)$, so M are $(5, -1)$.

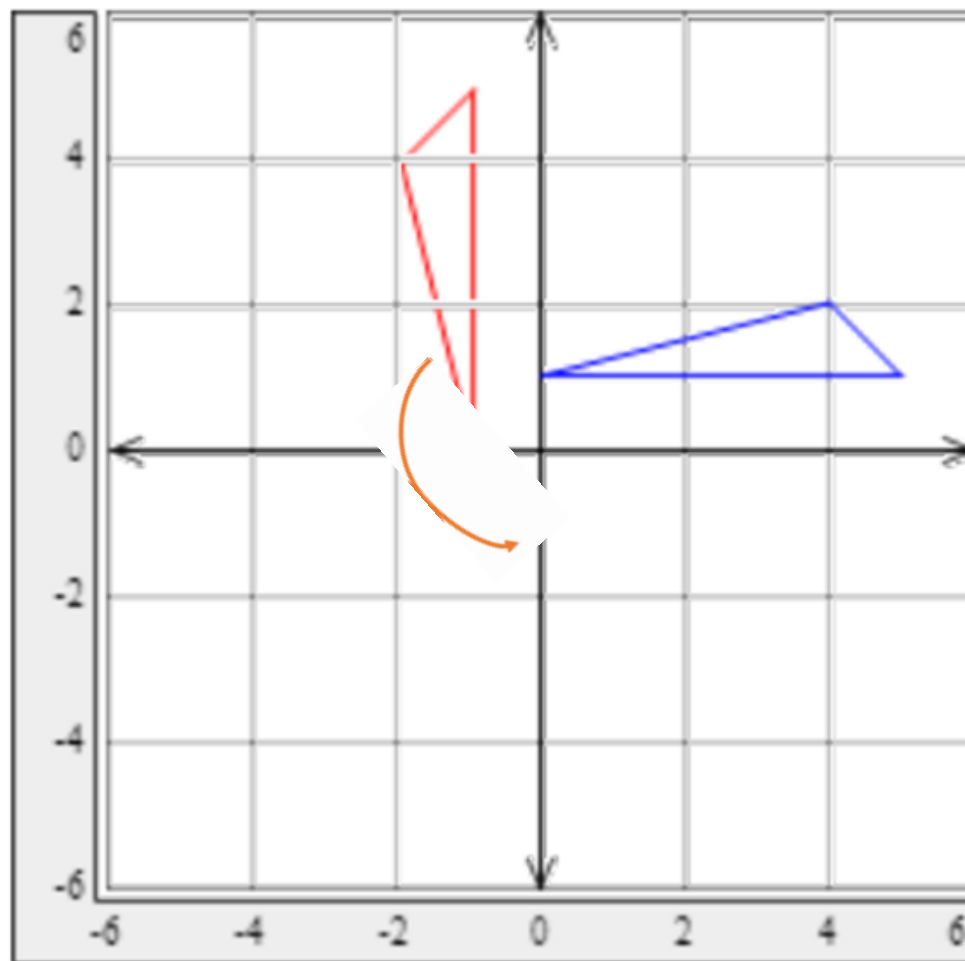
$N'(2, 2)$, so N are $(2, -2)$.

$P'(5, 1)$, so P are $(1, -5)$.



10 Select the image of the triangle after it has been rotated about the origin by 270° .

* Since every 90° rotation moves the preimage around the origin by 1 quadrant, a 270° rotation moves the preimage from quadrant 2 to quadrant 1.





Never say,
"I can't"
Always say,
"I'll try"