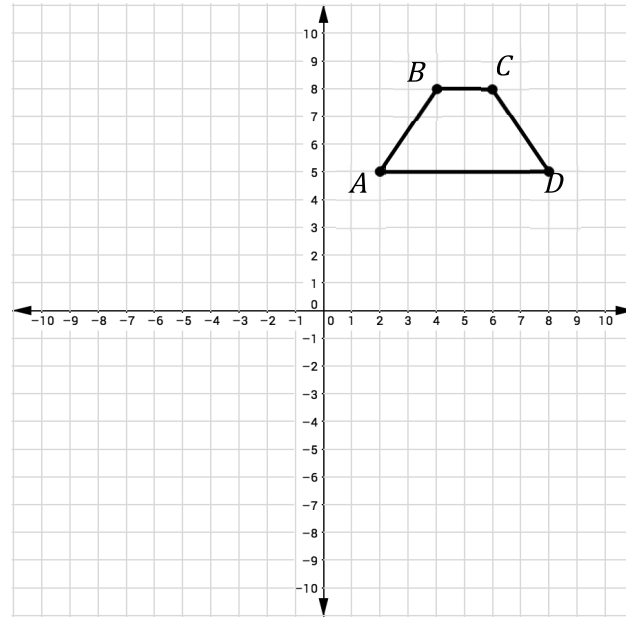


Section 4 – Topic 6

Rotation of Polygons – Part 1

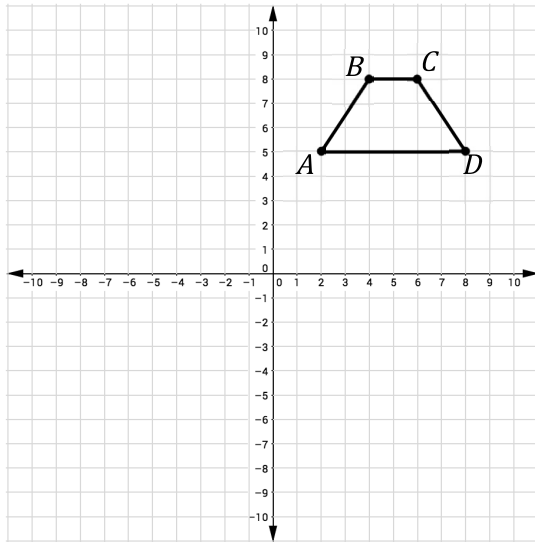
Consider polygon $ABCD$ and the transformed polygon that is rotated 90° , 180° , 270° , and 360° clockwise about the origin.



Vertices of $ABCD$	Vertices of 90° rotation	Vertices of 180° rotation	Vertices of 270° rotation	Vertices of 360° rotation
(2, 5)				
(4, 8)				
(6, 8)				
(8, 5)				



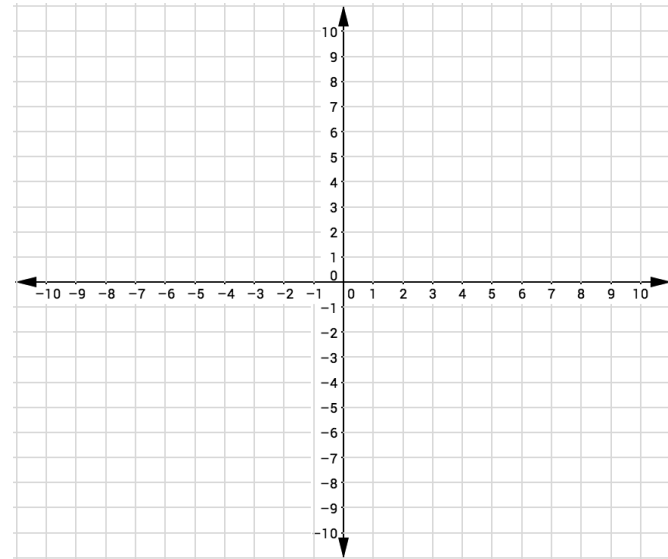
Consider polygon $ABCD$ and the transformed polygon that is rotated 90° , 180° , 270° , and 360° counterclockwise about the origin.



Vertices of $ABCD$	Vertices of 90° rotation	Vertices of 180° rotation	Vertices of 270° rotation	Vertices of 360° rotation
(2, 5)				
(4, 8)				
(6, 8)				
(8, 5)				

Let's Practice!

1. Rotate and draw $COMA$ 90° counterclockwise about the origin if the vertices are $C(1, -2)$, $O(0, 2)$, $M(3, 2)$, $A(3, -3)$.



What are the coordinates of $C'O'M'A'$?



Try It!

2. Samuel rotated $AMEN$ 270° clockwise about the origin to generate $A'M'E'N'$ with vertices at $A'(1, 5)$, $M'(1, 0)$, $E'(-1, -1)$, and $N'(-3, 2)$.

What is the sum of all y -coordinates of $AMEN$?

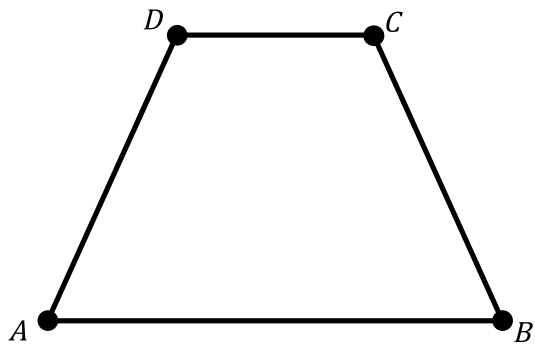
3. What happens if we rotate a figure around a different center point instead of rotating it around the origin?

Section 4 – Topic 7 Rotation of Polygons – Part 2

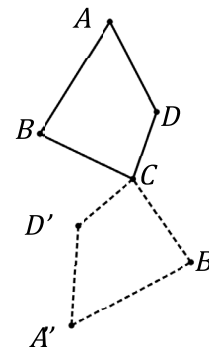
Use the following steps to rotate polygon $ABCD$ 155° clockwise about C . Use the figure on the following page.

- Step 1. Extend the line segment between the point of rotation, C , and another vertex on the polygon, towards the opposite direction of the rotation.
- Step 2. Place the center of the protractor on the point of rotation and line it up with the segment drawn in step 1. Measure the angle of rotation at C . Mark a point at the angle of rotation and draw a segment with your straightedge by connecting the point with the center of rotation, C .
- Step 3. Use a compass to measure the segment used in step 1. Keeping the same setting, place the compass on the segment drawn in step 2 and draw an arc where the new point will be located. Label the new point with a prime notation.
- Step 4. Copy the angle adjacent to the angle of rotation. Mark a point at the copied angle in the new figure. Draw a segment by connecting the point at the new angle with the point created in step 3.
- Step 5. Use a compass to measure the segment adjacent to the one used in step 1. Keeping the same setting, place the compass on the segment drawn in step 4 and draw an arc where the new point will be located. Label the new point with a prime notation.
- Step 6. Repeat steps 4-5 with the two other angles to complete the construction of the rotated polygon.





Consider the figure below.



Which is the point of rotation? How do you know?

Do you have enough information to determine if the rotation is clockwise or counterclockwise?

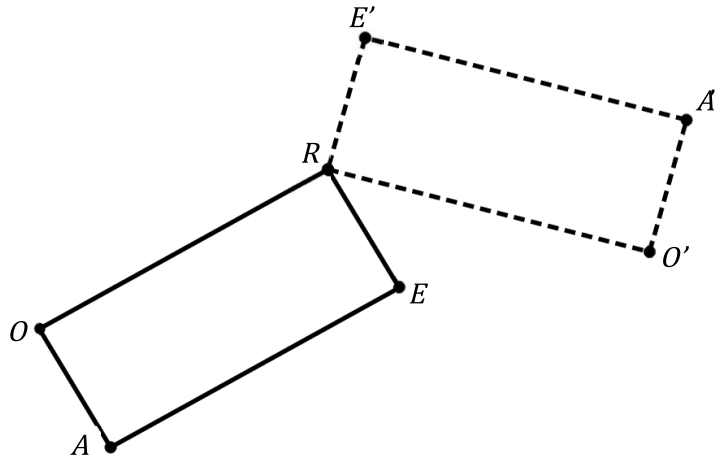
If the rotation is clockwise, should it be in between $0^\circ - 90^\circ$, $90^\circ - 180^\circ$, $180^\circ - 270^\circ$, or $270^\circ - 360^\circ$?

If the rotation is counterclockwise, should it be in between $0^\circ - 90^\circ$, $90^\circ - 180^\circ$, $180^\circ - 270^\circ$, or $270^\circ - 360^\circ$?



Let's Practice!

1. Consider the figure below.

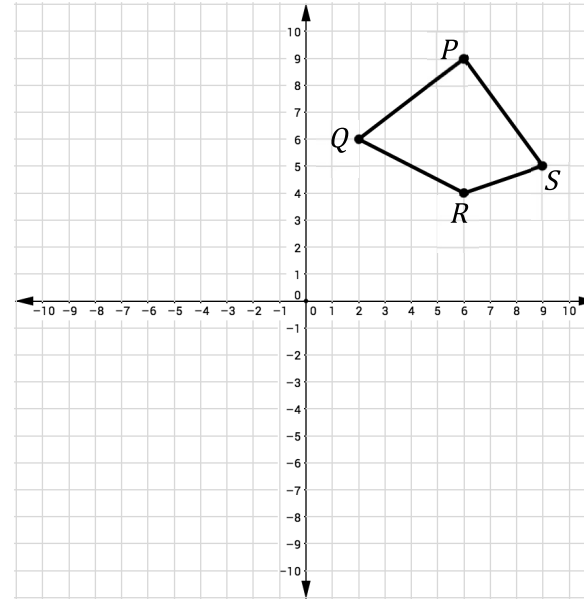


Which of the following statements is true?

- Ⓐ The figure shows quadrilateral $AERO$ rotated 45° counterclockwise about R and 90° clockwise about R .
- Ⓑ The figure shows quadrilateral $AERO$ rotated 45° clockwise about R and 90° counterclockwise about R .
- Ⓒ The figure shows quadrilateral $AERO$ rotated 135° clockwise about R and 225° counterclockwise about R .
- Ⓓ The figure shows quadrilateral $AERO$ rotated 135° counterclockwise about R and 225° clockwise about R .

Try It!

2. Consider quadrilateral $PQRS$ on the coordinate plane below.

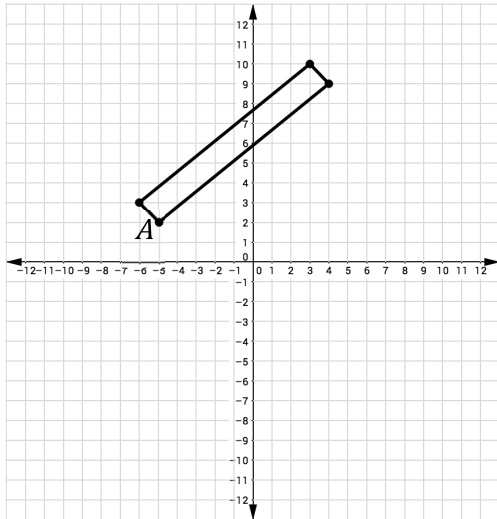


After a rotation of $PQRS$ 90° clockwise about the origin, answer each of the following questions.

- a. Which vertex will be at point $(-9, 6)$?
- b. What will be the coordinates of point R' ?

BEAT THE TEST!

1. Consider the quadrilateral below, in which A is the point for rotation.



Which figure on the following page shows the quadrilateral rotated 80° counterclockwise about A ?

