

Geometry Unit 1

Task 6: *Rotations in the Plane*

Plot the point $A(1, 2)$.

1. A' is the point obtained by rotating point A , about the origin, 90° counterclockwise.
 - a. What are the coordinates of A' ?
 - b. Explain how the rotation in *part a* changed the coordinates of point A .
2. What would be the coordinates of A' if the rotation was 90° clockwise rather than counterclockwise?

Plot points $A(-1, 1)$ and $B(-2, 3)$. Draw a line segment between the points.

3. Rotate line segment AB counterclockwise 90° about the origin. Label the endpoints A' and B' and state their coordinates.
4. Describe what happened to the line segment.
5. Consider the rotation of the segment in *Problem 3* and the point in *Problem 1*. Do you see a pattern? Explain.
6. Rotate line segment AB clockwise 90° about the origin. Label the endpoints A'' and B'' and state their coordinates.
7. Write a general rule for rotating the point (x, y) , about the origin, 90° counterclockwise.
8. Write a general rule for rotating the point (x, y) , about the origin, 90° clockwise.

Plot the point $C(-1, 4)$.

9. Let C' represent the point obtained by rotating point C counterclockwise 180° , about the origin.
 - a. What are the coordinates of C' ?
 - b. Explain how the rotation in *part a* changed the coordinates of point C .
10. What would be the coordinates of C' if the rotation was 180° clockwise rather than counterclockwise?

A quadrilateral has vertices at $A(1, 4)$, $B(4, 4)$, $C(4, 1)$, and $D(2, 1)$.

11. Rotate the quadrilateral 180° counterclockwise about the origin. Label the endpoints A' , B' , C' , and D' and state their coordinates.
12. Describe a method for rotating a figure 180° counterclockwise about the origin.
13. Write a general rule for rotating the point (x, y) 180° about the origin.