

Rotations on the Coordinate Plane

Each student will need a brass paper fastener to complete the right side of the page.

Introduction

Have a student stand in an open area. Place a piece of tape on the floor in front of the student. Have the student rotate around the object, continuously facing the object in the center. Ask students to identify what has changed (the student's location and orientation). Ask students what has not changed (the person).

Creating the Notebook Page

Guide students through the following steps to complete the right-hand page in their notebooks.

1. Add a Table of Contents entry for the Rotations on the Coordinate Plane pages.
2. Cut out the title and glue it to the top of the page.
3. Complete the explanation. (A **rotation** is a transformation that **turns** a figure around a given point called the **center of rotation**. The image has the **same** size and shape as the **pre-image**.)
4. Cut out the flap book. Cut on the solid lines to create three flaps. Cut out the triangle spinner. Place the spinner on top of the center dot on the graph. Push a brass paper fastener through the center dots of each piece to attach them. It may be helpful to create the hole in each piece separately first. Apply glue to the back of the right section and attach it to the top of the page. The paper fastener should not go through the page and the triangle should spin freely.
5. Cut out the 90° counterclockwise table. Glue it below the flap book.
6. Write the coordinates of each vertex in the table's *Pre-Image* columns. Rotate the triangle 90° counterclockwise, using the dashed line in quadrant II as a guide. Mark the triangle's new vertices and connect them to form the triangle. Label the interior of the triangle with the rotation. Write the coordinates of the new triangle in the *Image* column. Compare the coordinates. Under the 90° flap, write a rule to describe the change to the coordinates.
7. Repeat step 6 for the 180° and 270° counterclockwise rotations, respectively.

Rotations on the Coordinate Plane

A **rotation** is a transformation that **turns** a figure around a given point called the **center of rotation**. The image has the **same** size and shape as the **pre-image**.

90° counterclockwise
(270° clockwise)

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

270° counterclockwise
(90° clockwise)

90° counterclockwise		180° counterclockwise		270° counterclockwise	
Pre-Image	Image	Pre-Image	Image	Pre-Image	Image
A(2, 2)	A'(-2, 2)	A(2, 2)	A'(-2, -2)	A(2, 2)	A'(2, -2)
B(6, 2)	B'(-2, 6)	B(6, 2)	B'(-6, -2)	B(6, 2)	B'(2, -6)
C(6, 6)	C'(-6, 6)	C(6, 6)	C'(-6, -6)	C(6, 6)	C'(6, -6)

Reflect on Learning

To complete the left-hand page, have students use triple Venn diagrams to compare and contrast translations, reflections, and rotations.

Answer Key

90° counterclockwise: $(x, y) \rightarrow (-x, y)$; 180° : $(x, y) \rightarrow (-x, -y)$; 270° counterclockwise: $(x, y) \rightarrow (x, -y)$

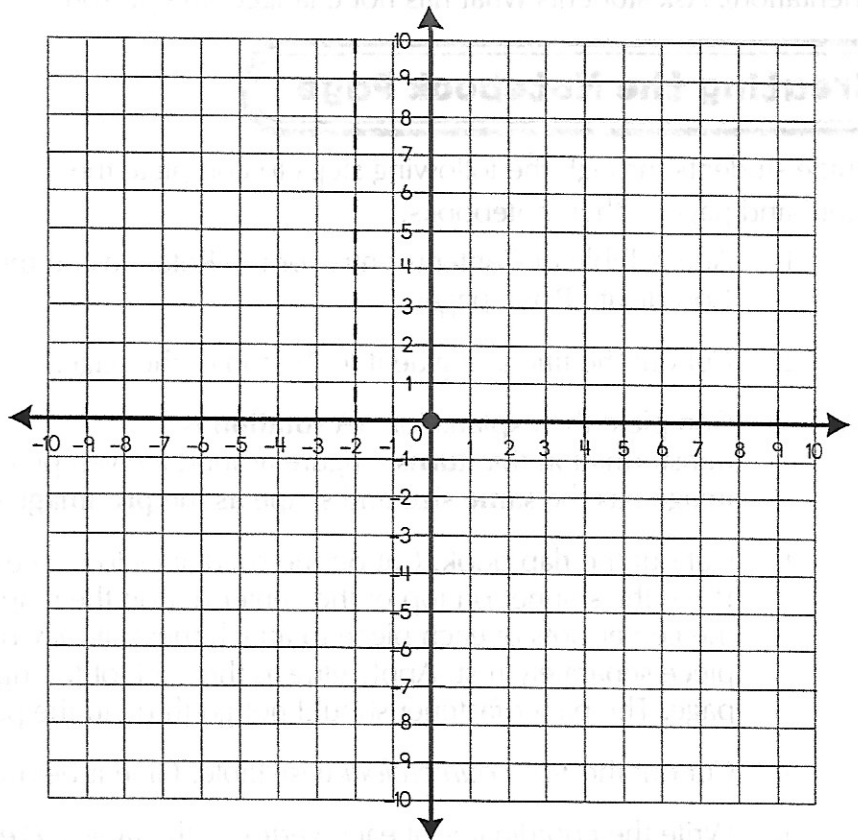
Rotations on the Coordinate Plane

A _____ is a transformation that _____ a figure around a given point called the _____ of _____. The image has the _____ size and shape as the _____.

90° counterclockwise
(270° clockwise)

180°

270° counterclockwise
(90° clockwise)



90° counterclockwise		180° counterclockwise		270° counterclockwise	
Pre-Image	Image	Pre-Image	Image	Pre-Image	Image

