# Reflecting a Triangle in the Coordinate Plane

Approximate Total Time: 40 minutes

ACTIVITY OVERVIEW:

In this activity we will

- Draw a triangle
- Find the coordinates of the triangle
- Reflect the triangle across the y-axis
- Find the coordinates of the reflected triangle
- Explore the relationship between the original coordinates and the coordinates of the reflected triangle
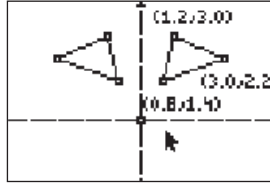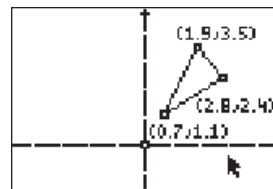
This activity provides a wonderful opportunity to blend coordinate geometry with our experience using drawing tools. We can visualize symmetry and reflecting a point across the y-axis.

NCTM Geometry Standards: Specify locations and describe spatial relationships using coordinate geometry and other representational systems. Apply transformations and use symmetry to analyze mathematical situations.

1

Press APPS. Move down to the CabriJr APP and press ENTER. Press ENTER, or any key, to begin using the application.

Press Y= for the F1 menu and select **New**. (If asked to **Save changes?** press ◄ ENTER to choose "No.")

2

To show the axes, press GRAPH for the F5 menu, move to **Hide/Show**, and then move right and down to **Axes**. Press ENTER.
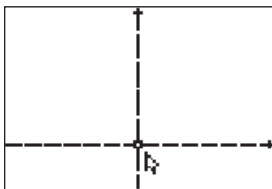
3

Move until the origin is flashing and press ALPHA to activate the *hand*. Move the origin until the axes are positioned as shown in the figure.

Press CLEAR to deactivate the *hand*.

4

To draw a triangle in the first quadrant, press WINDOW for the F2 menu. Move to **Triangle** and press ENTER. Move the pencil to the desired location of one of the vertices and press ENTER. Move to a second vertex and press ENTER. Move to the third vertex and press ENTER. Press CLEAR to turn off the **Triangle** tool.
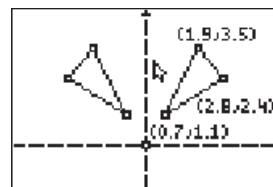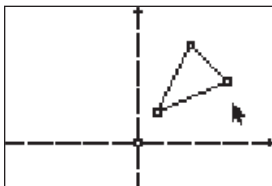
5

Press GRAPH for the F5 menu, move to **Coord. & Eq,** and then press ENTER. Move until a vertex is flashing and press ENTER. The coordinates of that vertex are displayed and can be moved to a convenient location. Press CLEAR to deactivate the *hand*. Move until another vertex of the triangle is flashing and then press ENTER. Use the hand to move the coordinates, then press CLEAR. Move until the third vertex is flashing and press ENTER. Move the coordinates then press CLEAR to deactivate the *hand*. Press CLEAR again to turn off the **Coord. & Eq.** tool.
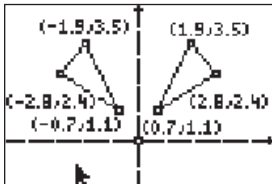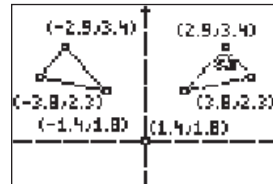
6

To reflect the triangle across the y-axis, press TRACE for the F4 menu, move to **Reflection**, and then press ENTER. Move until all sides of the triangle are flashing and press ENTER. Move until the y-axis is flashing and press ENTER. Press CLEAR to turn off the **Reflection** tool.
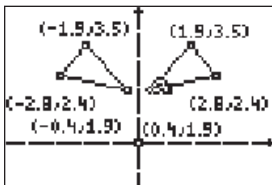

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7

Press [GRAPH] for the F5 menu, move to **Coord. & Eq,** and then press [ENTER]. Find the coordinates of the vertices of the reflected triangle using the same procedure as when finding the coordinates of the vertices of the original triangle.

8

What can you conclude about the coordinates of a figure when it is reflected across the y-axis?

It appears that the coordinates (x, y) becomes (-x, y) in the reflected image.

Test this conjecture by changing the original triangle. Move until a vertex is flashing, press [ALPHA], and then move the point. Observe the changes in the coordinates of the vertices of both triangles.

9

Press [CLEAR] to deactivate the *hand*. Move until all three sides of the original triangle are flashing and press [ALPHA]. Move the triangle and observe the changes in coordinates.

For TI-Navigator™ Users

Activity Center: Load a background image of a triangle in Quadrant 1. Have students mark a point on the triangle then mark a second point which is the image of the first point reflected across the y-axis. For help, see page 64.

10

To exit the APP, press [Y=] for the F1 menu. Move to **Quit**, then press [ENTER]. (Or you can press [2nd] [MODE] for [QUIT].)