

## Glide Reflections (Using Geometer's Sketchpad 4.0)

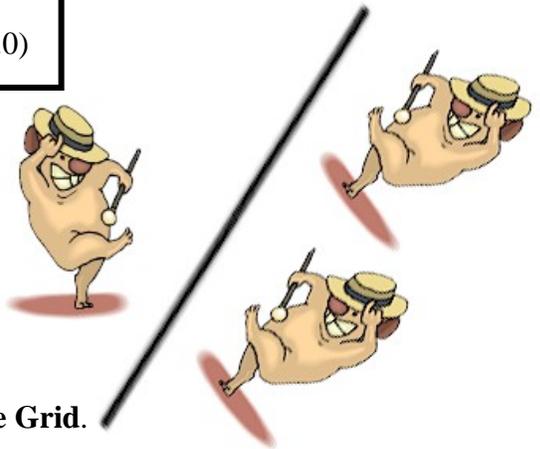
*Discover what happens when you glide a triangle.*

Open software and set up: Open Geometer's Sketchpad 4.0.



Expand the screen to full screen view. On the left vertical toolbar, be sure that the arrow is clicked.

Under **DISPLAY**, choose **Show Text Palette**.



Set the graph grid: Under **GRAPH**, choose **Grid Form, Square Grid**.

Plot the points for the triangle: Under **GRAPH**, choose **Plot Points** and plot (2,1), (6,2), (3,4).

In the drop down box for Plot Points, use your mouse (or TAB key) to enter the coordinates. Hit PLOT.

Complete the triangle: To draw the triangle, highlight (by clicking on) the three points. Choose **CONSTRUCT, Segments**. If you would like to label your triangle vertices, choose the A  from the left vertical toolbar, and click on each point.

Highlight the three vertices only of the triangle. Choose **CONSTRUCT, Interior**. Adjust your color by right clicking in the triangle interior and choosing a new color.

Measure the coordinates: Highlight one point. Be sure only the point is highlighted. Under **MEASURE**, choose **Coordinates**. This will place the coordinates on the screen. Repeat this process for each of the points.

Construct line of reflection: With the line tool , draw a line for the reflection. Locate two points on the line approximately 2 inches apart. Highlight the two points. Choose **TRANSFORM, Mark Vector**. Highlight the line and choose **TRANSFORM, Mark mirror**.

Reflect the figure: You will need to select the triangle by drawing a marquee around the figure.

With your arrow clicked, use your mouse to click a starting corner to draw a box (marquee) around the triangle. The triangle will become highlighted. Under **TRANSFORM**, choose **Reflect**. 

Translate the figure: With the reflected image still highlighted, choose **TRANSFORM, Translate**.

This second image is a Glide Reflection of the original figure.

Now investigate:

1. Highlight one side of the original triangle. Choose MEASURE, Length. Record this length. \_\_\_\_\_  
Highlight the corresponding side of the glide triangle. MEASURE, Length. Record this length.

\_\_\_\_\_ Do the sides of a triangle maintain their lengths through a glide reflection? \_\_\_\_\_

2. Choose an angle in the original triangle by highlighting three vertices in order. Choose MEASURE, Angle. Record this measurement. \_\_\_\_\_  
Highlight the corresponding angle in the glide triangle. MEASURE, Angle. Record this measurement. \_\_\_\_\_

Do the angles of a triangle maintain their measurements through a glide reflection? \_\_\_\_\_

3. Generalize your findings into a composition formula which can be used to represent a glide reflection.

Glide Reflection: \_\_\_\_\_  $\circ$  \_\_\_\_\_

4. Think about how a translation can be expressed as a composition of two reflections.  
What three transformations can compose a glide reflection? \_\_\_\_\_

\_\_\_\_\_ Sketch a diagram to illustrate your three compositions:

