Name: _____ (Remember: Edit, Preferences, Units, Tenths, Tenths, Check New Sketches)

Geometer's Sketchpad Project #3 (Math EL)

- ✓ **Geometry Activity #3.1 – Translations**
- ✓ **Geometry Activity #3.2 – Reflections & Triangle Area and Perimeter Ratios**
- ✓ **Geometry Activity #3.3 – Dueling Pinwheels**

Remember:

- ✓ After logging on and opening Geometer's Sketchpad, you need to click on "Edit," then click on "Preferences," then change to the precision to "Units-Tenths-Tenths," and then make sure you check "New Sketches."
- ✓ After completing a task, you should click on "File" and then "New Sketch."

Score: _____ out of 18 Points

Name: _____ (Remember: Edit, Preferences, Units, Tenths, Tenths, Check New Sketches)

Geometry Activity #3.1 – Translations

Task #1

Go to http://www.mrhayden.com/, click on Sketchpad Activities, and then click on Translations. You will see a trapezoid on a coordinate plane. Translate each point of the trapezoid 12 units to the left and 6 units up. Construct segments when all four points have been translated.

Task #2

Close this file and open it again from my website. You are going to translate the same trapezoid in an easier way. Click on all four segments and points. Then click on "Transform," and then "Translate." Choose "Rectangular" for the "Translation Vector." Enter -12 for horizontal and 6 for vertical. Then click on "Translate."

Task #3

In Sketchpad, click on "File," then "New Sketch."

Click on "Graph," then "Grid Form," and then "Rectangular Grid."

Click on "Graph," and then "Snap Points."

Practice translating using the method introduced in Task #2. Create any polygon that you want to translate. Also use negative numbers to see what happens. 

Task #4

In Sketchpad, click on "File," then "New Sketch."

Click on "Graph," then "Grid Form," and then "Rectangular Grid."

Click on "Graph," and then "Snap Points."

We are going to translate a triangle in a new way. First, plot points (-6,-2), (-3,2), and (-1,-1). Now construct segments connecting these points to form a triangle. 

Now construct a point at (10,-6). Make sure that you do not have anything selected. Click on points (-1,-1) and (10,-6). Now click on "Transform," and then "Mark Vector." Now select the entire triangle. Finally, click "Transform," then "Translate." 

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Geometry Activity #3.2 – Reflections & Triangle Area and Perimeter Ratios

Task #1

Go to http://www.mrhayden.com/, click on Sketchpad Activities, and then click on Reflections. You will see a picture of a person's face. Click and drag a point to see what happens. There is a line of symmetry, which causes each side of the face to change when you drag a point.

Task #2

In Sketchpad, click on "File," then "New Sketch."

Construct a vertical line. Construct a point on the line in the middle of the screen. Select the line and the point that you just created only. Click on "Construct," then "Perpendicular Line."

Your screen should now be divided into four areas. Construct a circle in the upper left area. Now double click on the vertical line. Select only the circle. Click on "Transform," then "Reflect."

You should now have a circle in the upper right. Now select both cirlces and double click on the horizontal line. Click on "Transform," then "Reflect."

Now change the size of the original circle and move it around to see what happens.

Task #3

Create a sketch on your own that using the reflection technique that you just learned.

Task #1

Construct any triangle and determine the midpoints of the three sides. Create segments that connect the midpoints to create another triangle. Create triangle interiors for the small and big triangles.

Task #2

Measure the area and perimeter of both the small and big triangles.

Use the calculator to find the ratio of area of the big triangle to the area of the small triangle.

Use the calculator to find the ratio of the perimeter of the big triangle to the perimeter of the small triangle.

Animate one of the vertices of the big triangle to see what happens to the ratios.

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Geometry Activity #3.3 – Dueling Pinwheels

Task #1

- ✓ With the **circle** tool, construct a circle.
- ✓ Hide the point on the circle (not the center point).
- ✓ With the **segment** tool, construct two radii and a chord, forming an acute **triangle**.
  NOTE: A chord is a segment that connects two points that are on a circle and does not go through the center point.

Task #2

- ✓ With the **select** tool, select the three vertices of the triangle. From **Construct Menu**, construct the **triangle interior**.
- ✓ Select the center of the circle. From the Transform Menu, **mark center** or **double-click** on the center of the circle.
- ✓ Select the center **and** the triangle. From the Transform Menu, **rotate**. At the rotate window, rotate by 60°.
- ✓ From the Transform Menu, rotate again by 60° until there are **6 triangles**.
- ✓ Change the color of each of the six triangles.

Task #3

- ✓ Select one point on the circle. Go Edit, click on **Action Buttons** and then **Animation**. Setup the point to animate around the circle.

Task #4

- ✓ Using reflections, you can create more pinwheels to animate at the same time.