**Transformations Activity:**

In this activity you will explore some functional transformations.

**Part I:** Open the Excel File called **Transformations** and follow the directions given in the six tabs at the bottom.

**Transformation 1:** *Play around with the x and y values in the Input columns.*

**Describe what is happening:**

**Explain in detail how Excel is doing this:**

**Give a *recursive formula* for this transformation (how does the new values of x and y depend on the old values of x and y)**

**xnew = ynew=**

**Express the transformation in function notation (discover as a class):**

**Transformation 2:** *Play around with the values in the input columns but don’t touch the 0’s. First keep the two values the same and then change them so they are different.*

**Describe what is happening:**

**Explain in detail how Excel is doing this:**

**Give a *recursive formula* for this transformation (how does the new values of x and y depend on the old values of x and y)**

**xnew = ynew=**

**Express the transformation in function notation (discover as a class:**

**Transformation 3:** *Play around with the values in the input columns but don’t touch the 0’s. First keep the two values the same and then change them so they are different.*

**Describe what is happening:**

**Explain in detail how Excel is doing this:**

**Give a *recursive formula* for this transformation (how does the new values of x and y depend on the old values of x and y)**

**xnew = ynew=**

**Express the transformation in function notation (discover as a class:**

**Transformation 4:** *Play around with the values of the angles in the input. Choose values of the angles that range from -360 to 360.*

**Describe what is happening:**

**Explain in detail how Excel is doing this:**

**Give a *recursive formula* for this transformation (how does the new values of x and y depend on the old values of x and y)**

**Xnew = ynew=**

**Express the transformation in function notation (discover as a class:**

**Transformation 5:** *Play around with the values of x and y in Input 1. Play around with the values of the angle in the Input 2 area. Choose angles values ranging from -360 to 360.*

**Describe what is happening:**

**Explain in detail how Excel is doing this:**

**Give a *recursive formula* for this transformation (how does the new values of x and y depend on the old values of x and y)**

**Xnew = ynew=**

**Express the transformation in function notation (discover as a class:**

**Part II:** Perform these transformations on your own shape.

1. Start a new Excel file and make six tabs at the bottom. Give them the following names: **Original, Translation, Dilation, Reflection, Rotation, Combination.**
2. In the **Original** tab, generate a set of points written in two columns that will show a familiar shape when graphed. Don’t choose a shape with too much symmetry (like a circle) because this will not show changes when you apply the transformations.
3. In the **Translation, Dilation, Reflection** and **Rotation** tabs, copy the original set of points. Then apply a transformation calculation to generate a second set of columns. Graph both sets on the same chart to show the changes clearly.
4. In the **Combination** tab, apply two or more of the transformations. Show the original set of columns and the set of columns that shows each stage of the transformation. Show the graphs of the original figure, the intermediate figure and the final figure.

Turn in this completed activity sheet and post the two completed Excel documents in the Discussion Board.