

Name: \_\_\_\_\_  
Geometry Chapter 9  
Transformations Project

Date: \_\_\_\_\_  
Hour: \_\_\_\_\_

### Composition of Transformations Project

**In this project, you will be using *translation, reflection, rotation* and *dilation* to move a figure around the coordinate plane. Use the following steps to help you complete the composition.**

**Step 1:** Draw the shape of your choice on the x-y coordinate plane. Your shape must have at least 5 points, but it may have more. Do **NOT** draw a regular pentagon. Assign each point a letter and label your figure accordingly. *Write each coordinate point on the back of this paper.*

**Step 2:** *On the back of this paper, write the rule for a translation that moves your figure to the left 5 and up 6. Under the rule, also give the points of the NEW IMAGE and then graph these new points on your coordinate grid. Your translated shape should be graphed in a new color and labeled with its new image points.*

**Step 3:** *On the back of this paper, write the rule for a reflection over the x-axis. Now apply the reflection to your translated figure from **Step 2**. Give the new points under this reflection and then graph these points on your coordinate grid. Your reflected figure should be in a new color and labeled with new image points.*

**Step 4:** *On the back of this paper, write the rule for a rotation of 90 degrees counterclockwise about the origin. Apply the rotation to the reflected figure in **Step 3**. List the new points for the figure and then graph these points on the coordinate plane. The newly rotated shape should be a new color and clearly labeled with its new image points.*

**Step 5:** Next, list the rule for a dilation centered at the origin with a scale factor of  $\frac{1}{2}$ . Now apply the dilation to the **ORIGINAL** figure in **step 1**. Under your dilation rule, list the newly dilated points. This should be your fourth and final transformation. You should have five figures drawn on your plane (this includes your pre-image). Graph the new points in a different color and be sure to label them with new image points.

**Grading:** *This will be worth a quiz grade, so follow directions and give correct pre-image and image coordinates! I will be looking for:*

- Original number coordinates and rule for each transformation
- Finding new number coordinates and graphing points for each transformation
- Proper labeling (A, A', A'' etc) of pre-image and image points
- Correct answering of the questions at the end

You will need to hand in this paper with the back completed and your coordinate grid (stapled).  
*Make sure to put your **name** on the top of your coordinate grid.*

Name: \_\_\_\_\_  
Geometry

Due Date: \_\_\_\_\_  
Hour : \_\_\_\_\_

### Composition of Transformations Project

**Step 1:**

1. What are the original coordinates of your pre-image (*and name of each point*):

**Step 2:**

1. Write the rule for a translation that moves your pre-image to the left 5 and up 6.
  
2. What are the new coordinates (and name of each point) of your new figure:

**Step 3:**

1. Write the rule for a reflection over the x-axis.
  
2. What are the new coordinates (and name of each point) of your new figure:

**Step 4:**

1. Write the rule for a rotation of 90 degrees counterclockwise (about the origin).
  
2. What are the new coordinates (and name of each point) of your new figure?
  
3. Does your figure have rotational symmetry? \_\_\_\_\_ If so, what is the order \_\_\_\_\_ and magnitude \_\_\_\_\_?

**Step 5:**

1. Write the rule for a dilation with a scale factor of  $\frac{1}{2}$  (centered at the origin). Remember, you are dilating your ORIGINAL pre-image from Step 1!
  
2. What are the new coordinates (and name of each point) of your new figure:

QUESTIONS to answer:

1. Which of the step(s) above created an isometry? Why? \_\_\_\_\_
  
2. How many lines of symmetry does your figure have? \_\_\_\_\_ Does it have point symmetry? \_\_\_\_\_

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