## **Composition of Motions Practice - Honors**

Name:

For #1-8, there is a composition of motions. Using your algebraic rules, come up with a new rule after both transformations have taken place.

1) Translate a triangle 4 units right and 2 units up, and then reflect the triangle over the line y = x.

2) Rotate a triangle 90 degrees counter clockwise, and then dilate the figure by a scale factor of 3.

3) Translate a triangle 4 units left and 2 units down, and then reflect the triangle over the y-axis.

4) Rotate a triangle 90 degrees clockwise, and then dilate the figure by a scale factor of 1/3.

5) Translate a triangle 4 units right and 2 units down, and then reflect the triangle over the x-axis.

6) Rotate a triangle 180 degrees counter clockwise, and then dilate the figure by a scale factor of 2.

7) Translate a triangle 4 units left and 2 units up, and then reflect the triangle over the line y = x.

8) Rotate a triangle 180 degrees clockwise, and then dilate the figure by a scale factor of 1/2.

9)



**a.** On a coordinate grid, draw a triangle using A(-9, -2), B(-6, -1), C(-6, -3) to represent a duck foot.

**b.** Transform  $\triangle ABC$  using  $R_{x-axis}$ , followed by  $T: (x, y) \rightarrow (x + 5, y)$ . Label the final image  $\triangle A'B'C'$ .

**c.** Write a coordinate rule for this composite transformation.

**d.** Does the order in which you apply the translation and reflection matter in this case? Why or why not?

Adapted from Core-Plus Mathematics Course 2, Pg. 224

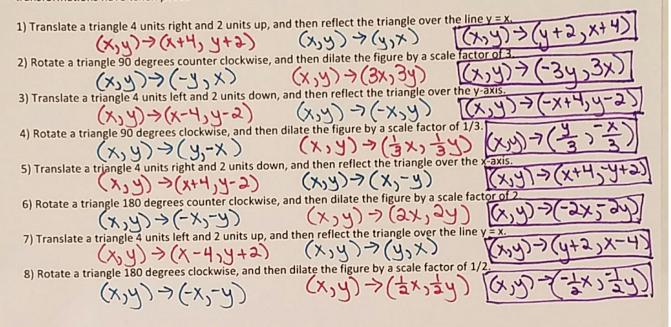
**e.** Now apply the coordinate rule you gave in Part c at least three more times to  $\Delta A'B'C'$ . Describe how alternate images such as images one and three, or two and four, are related.

10) Start with a new triangle. Then apply a glide reflection in which the reflection line is the y-axis. Write a coordinate rule for this glide reflection.

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For #1 - 8, there is a composition of motions. Using your algebraic rules, come up with a new rule after both transformations have taken place.



a. On a coordinate grid, draw a triangle using A(-9, -2), B(-6, -1), C(-6, -3) to represent a duck foot.

**b.** Transform  $\triangle ABC$  using  $R_{x-axis}$ , followed by  $T: (x, y) \rightarrow (x + 5, y)$ . Label the final image  $\triangle A'B'C'$ .  $(x, y) \rightarrow (x - y)$ 

c. Write a coordinate rule for this composite transformation.  $(x, y) \rightarrow (x+5, -y)$ 

**d.** Does the order in which you apply the translation and reflection matter in this case? Why or why not?

No. The translation vector is // to the reflection line, so the order does NOT matter

e. Now apply the coordinate rule you gave in Part c at least three more times to ΔA'B'C'. Describe how alternate images such as images one and three, or two and four, are related. 1+3 as e translations by 10 units 2+4 are translations by 10 units

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9)

10) Start with a new triangle. Then apply a glide reflection in which the reflection line is the y-axis. Write a coordinate rule for this glide reflection.