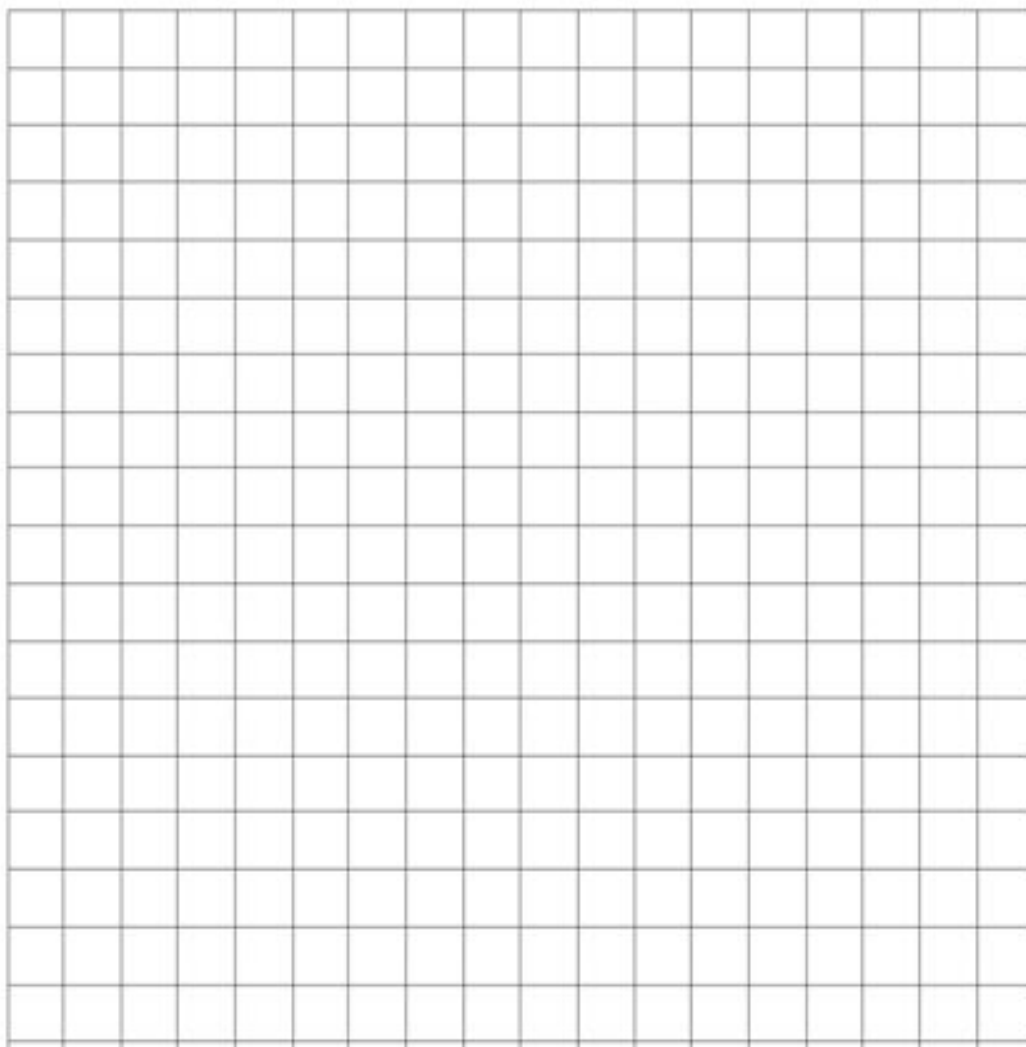


## Practice 1: Composition of Motions

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

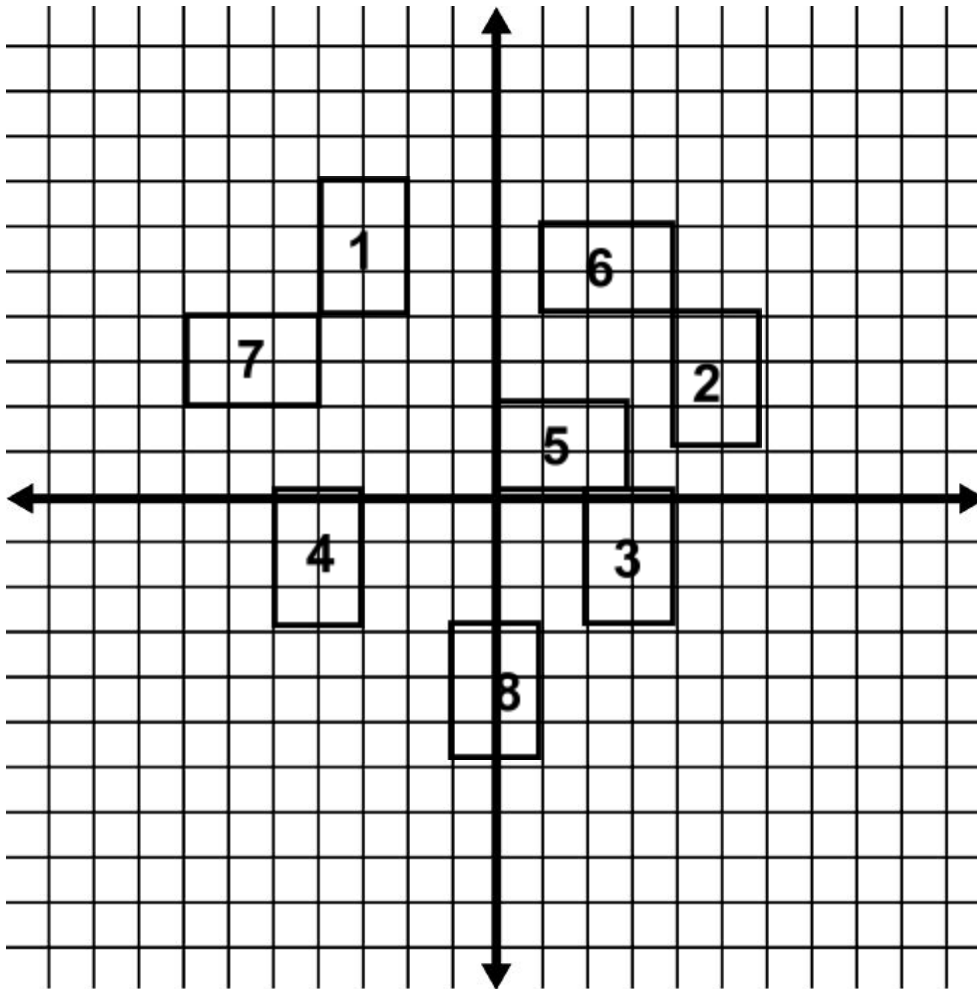
For #1 – 8, there is a composition of motions. Using your algebraic rules, write a new rule after both transformations have taken place. (Hint: Write algebraic rules for each transformation. Then, determine a **single** algebraic rule that would accomplish the same motion with a **single** transformation.)

- 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  $1/2$ .



## Practice 2 - Challenge: Compositions of Transformations with Coordinates

All rectangles in the grid below are congruent. Follow the instructions and then write the number of the rectangle that matches the location of the final image.



Which rectangle is the final image of each transformation?

1. Reflect Rectangle 1 over the  $y$ -axis. Then translate down three units and rotate  $90^\circ$  counterclockwise around the point  $(3, 1)$ . (Hint: redraw the axes so that the origin corresponds to  $(3, 1)$ .)
2. Translate Rectangle 2 down one unit and reflect over the  $x$ -axis. Then reflect over the line  $x = 4$ .
3. Reflect Rectangle 3 over the  $y$ -axis and then rotate  $90^\circ$  clockwise around the point  $(-2, 0)$ . Finally, glide five units to the right.
4. Rotate Rectangle 4  $90^\circ$  clockwise around the point  $(-3, 0)$ . Reflect over the line  $y = 2$  and then translate one unit left.
5. Translate Rectangle 5 left five units. Rotate  $90^\circ$  clockwise around the point  $(-2, 2)$  and glide up two spaces.
6. Rotate Rectangle 6  $90^\circ$  clockwise around the point  $(4, 4)$  and translate down three units.
7. Rotate Rectangle 7  $90^\circ$  clockwise around  $(-4, 4)$  and reflect over the line  $x = -4$ .
8. Reflect Rectangle 8 over the  $x$ -axis. Translate four units left and reflect over the line  $y = 1.5$ .