

# Transformations Review

Name \_\_\_\_\_

**\*\*THIS IS YOUR DAY 6 CLASSWORK – THIS WILL BE TURNED IN FOR A SEPARATE GRADE\*\***

Directions: For each problem-

- (1) **Vertices of Images**- you will include work (using transformation rules from the pre-image to image, and second image when applicable) to calculate the vertices after each listed transformation. Make sure the coordinates are clearly written! **WRITE THE SYMBOLIC RULES UNDERNEATH YOUR GRAPH.**
- (2) **Graphs**- you will sketch the pre-image figure and the image figure (and the second image when applicable) that is formed after each listed transformation together on the same graph, per problem number. If you change the scale on the x- or y- axis, be sure to mark if it is by 2s, etc. Label each pre-image and image with the proper vertex names and markings. Make sure to **color/highlight/shade** each image figure in a different color than the pre-image figure on the graphs & label all vertices!

## Translations

1. Triangle ABC with A(3, -2), B(1, 3), and C(-3, 3); left 4, down 1
2. Polygon PQRST with P(-1, -1), Q(-5, 1), R(-2, 4), S(0, 4), and T(2, 1); right 3, down 2

## Dilations

3. Triangle ABC with A(3, -2), B(1, 3), and C(-3, 3); scale factor = 3
4. Polygon PQRST with P(-1, -1), Q(-5, 1), R(-2, 4), S(0, 4), and T(2, 1); scale factor =  $\frac{1}{2}$

## Reflections

5. Triangle ABC with A(3, -2), B(1, 3), and C(-3, 3);  $y = x$
6. Polygon PQRST with P(-1, -1), Q(-5, 1), R(-2, 4), S(0, 4), and T(2, 1); y-axis
7. Quadrilateral DEFG with D(-4, 5), E(2, 6), F(3, 1), and G(-3, -4); x-axis

## Rotations

8. Triangle ABC with A(3, -2), B(1, 3), and C(-3, 3);  $90^\circ$
9. Polygon PQRST with P(-1, -1), Q(-5, 1), R(-2, 4), S(0, 4), T(2, 1);  $180^\circ$
10. Quadrilateral DEFG with D(-4, 5), E(2, 6), F(3, 1), and G(-3, -4);  $270^\circ$

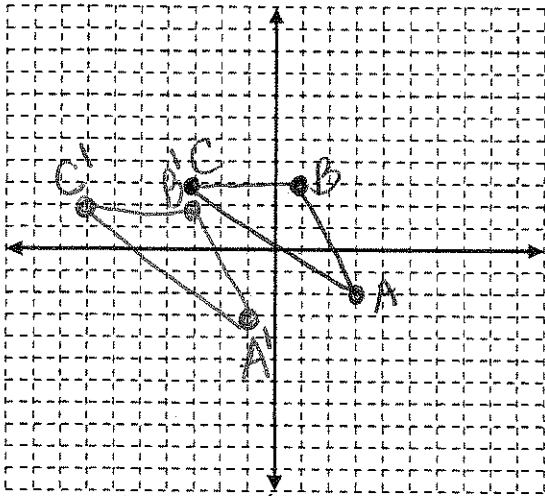
## Multiple Transformations (graph pre-image, image, and second image all together)

Complete the multiple transformations in the order listed. You should have three drawings in each graph.

11. Triangle ABC with A(3, -2), B(1, 3), and C(-3, 3); translate left 5, up 2, then a  $90^\circ$  rotation (CCW)  $(-y, x)$
12. Polygon JKLMNO with J(-3, 1), K(-2, 4), L(2, 4), M(3, 1), N(2, -2) and O(-2, -2); dilate with scale factor 2, then a reflection in the line  $y = -x$

$$(x, y) \rightarrow (-y, -x)$$

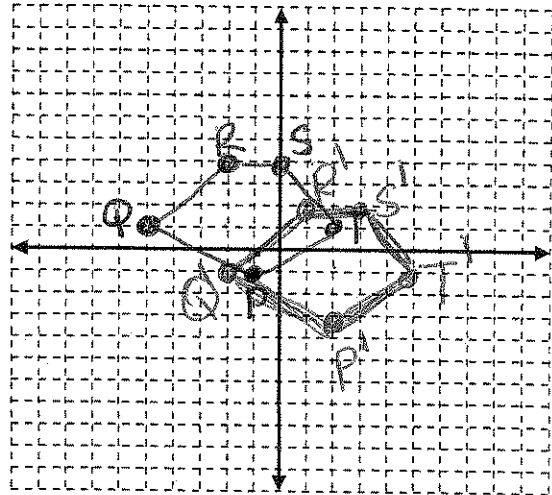
1.



1.  
 A  $(-1, -3)$   
 B  $(-3, 2)$   
 C  $(-7, 2)$

Rule: translation  
 $(x, y) \rightarrow (x-4, y-1)$

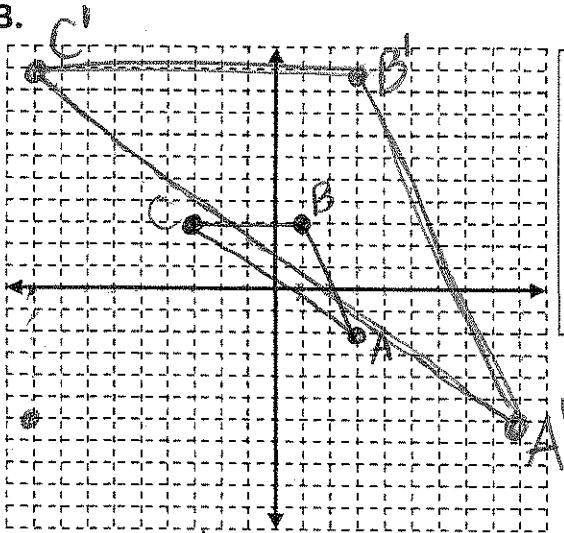
2.



2.  
 P  $(2, -3)$   
 Q  $(-2, -1)$   
 R  $(1, 2)$   
 S  $(3, 2)$   
 T  $(5, -1)$

Rule: translation  
 $(x, y) \rightarrow (x+3, y-2)$

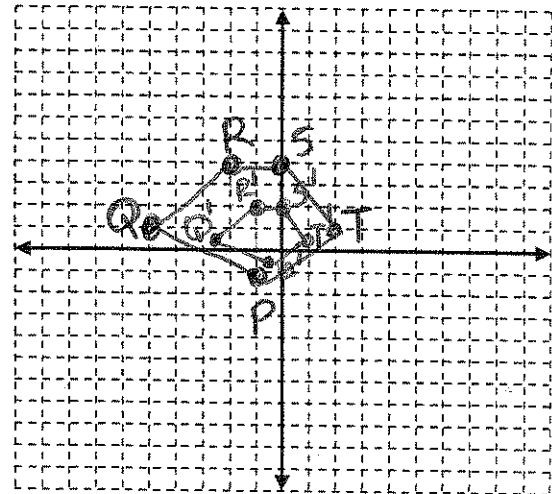
3.



3.  
 A  $(9, -6)$   
 B  $(3, 9)$   
 C  $(-9, 9)$

Rule: dilation  
 $(x, y) \rightarrow (3x, 3y)$

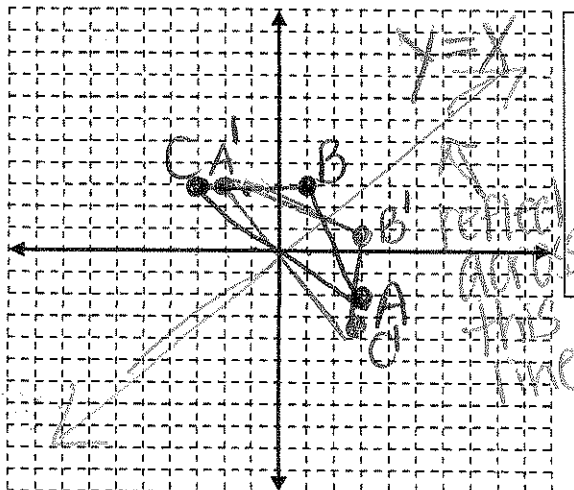
4.



4.  
 P  $(\frac{1}{2}, \frac{1}{2})$   
 Q  $(-\frac{5}{2}, \frac{1}{2})$   
 R  $(-1, 2)$   
 S  $(0, 2)$   
 T  $(1, \frac{1}{2})$

Rule: dilation  
 $(x, y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$

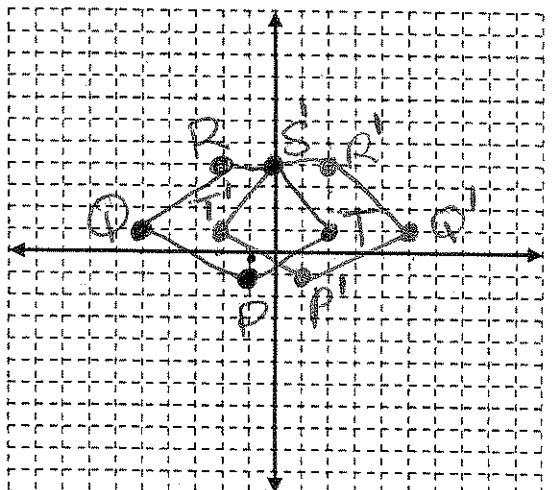
5.



5.  
 A  $(2, 3)$   
 B  $(3, 1)$   
 C  $(3, 3)$

Rule: reflect over  $y=x$   
 $(x, y) \rightarrow (y, x)$

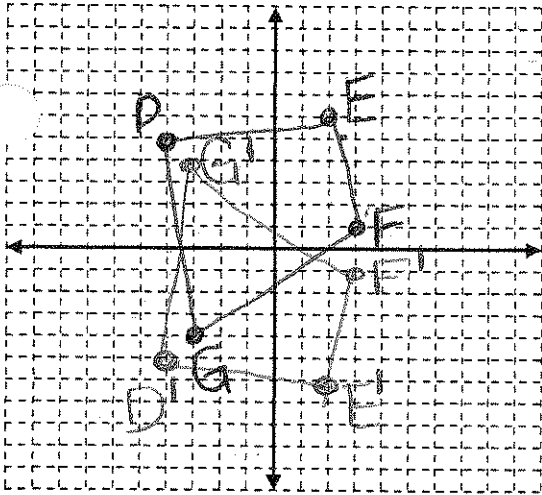
6.



6.  
 P  $(1, 1)$   
 Q  $(5, 1)$   
 R  $(2, 4)$   
 S  $(0, 4)$   
 T  $(-2, 1)$

Rule: reflect over y-axis  
 $(x, y) \rightarrow (-x, y)$

7.

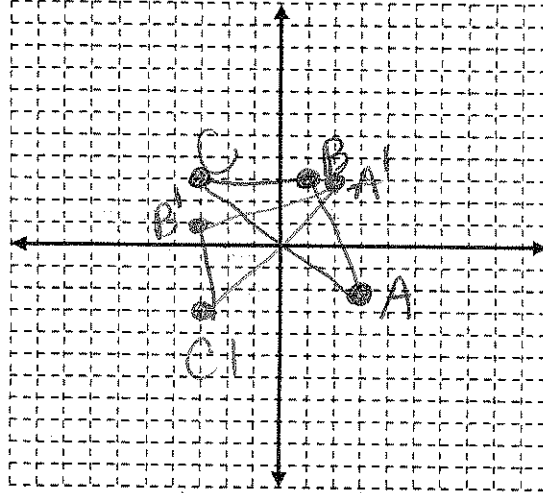


7.

$$\begin{aligned} D & (-4, 5) \\ E & (2, 6) \\ F & (3, 1) \\ G & (-3, 4) \end{aligned}$$

Rule: reflect over x axis  
 $(x, y) \rightarrow (x, -y)$

8.

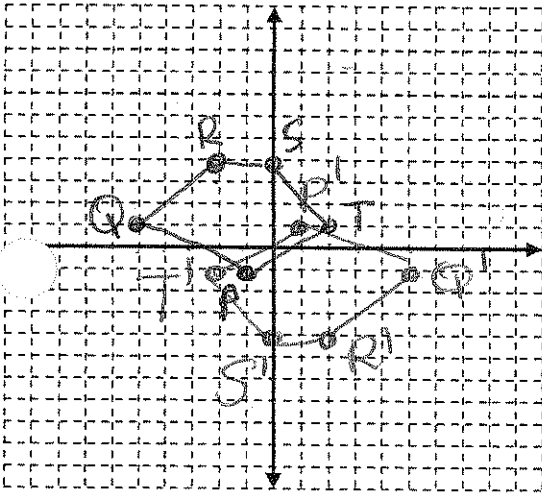


8.

$$\begin{aligned} A & (2, 3) \\ B & (-3, 1) \\ C & (-3, 3) \end{aligned}$$

Rule: rotate 90° ccw  
 $(x, y) \rightarrow (-y, x)$

9.

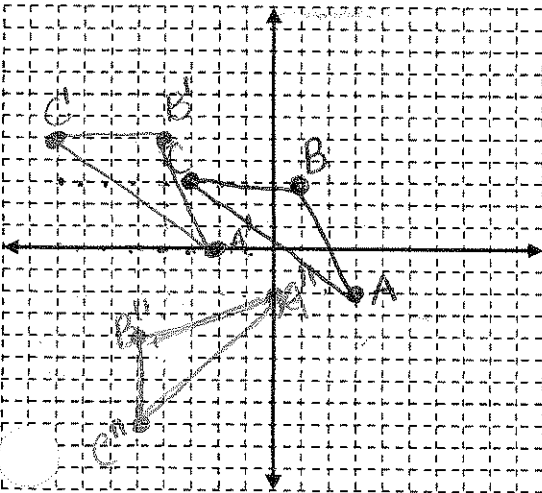


9.

$$\begin{aligned} P & (1, 1) \\ Q & (5, 1) \\ R & (2, 4) \\ S & (0, 4) \\ T & (-2, 1) \end{aligned}$$

Rule: rotate 180°  
 $(x, y) \rightarrow (-x, -y)$

11.

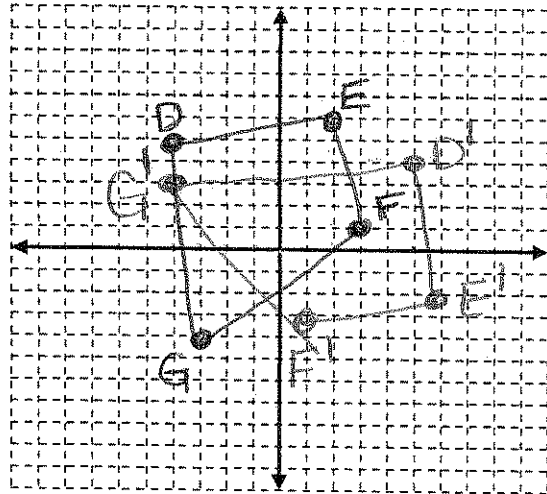


11.

$$\begin{aligned} A & (-2, 0) \\ B & (-4, 5) \\ C & (-8, 5) \\ A'' & (0, 2) \\ B'' & (-5, 4) \\ C'' & (-5, 8) \end{aligned}$$

Rule:  
 $(x, y) \rightarrow (-y+2, x-5)$

10.

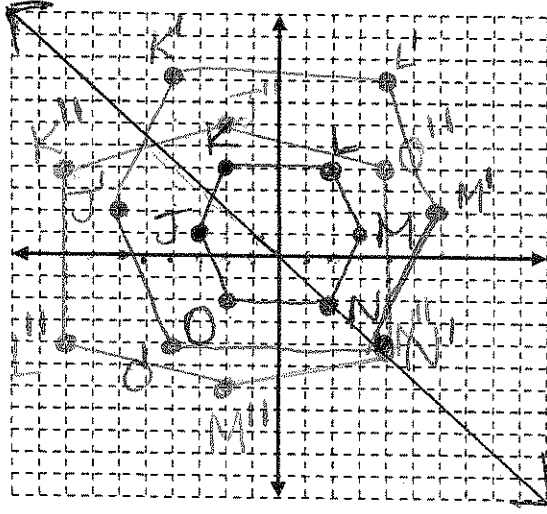


10.

$$\begin{aligned} D & (5, 4) \\ E & (6, 2) \\ F & (1, 3) \\ G & (-4, 3) \end{aligned}$$

Rule: rotate 270° ccw  
 $(x, y) \rightarrow (y, -x)$

12. BONUS



12.

$$\begin{aligned} J & (-6, 2) \\ K & (-4, 8) \\ L & (4, 8) \\ M & (6, 2) \\ N & (4, -4) \\ O & (-4, -4) \\ J' & (-2, 6) \\ K' & (-8, 4) \\ L' & (-8, -4) \\ M' & (-2, -6) \\ N' & (4, 4) \\ O' & (4, 4) \end{aligned}$$

Rule:  
 $(x, y) \rightarrow (-2y, -2x)$

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