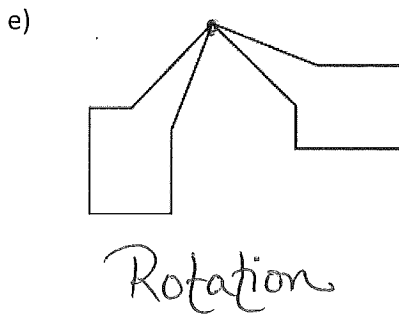
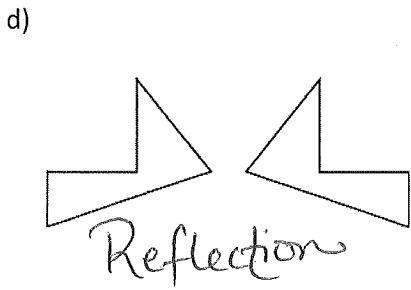
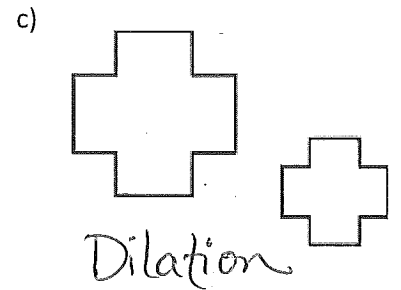
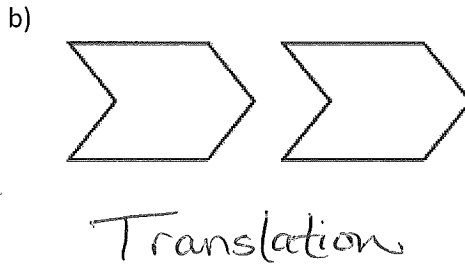
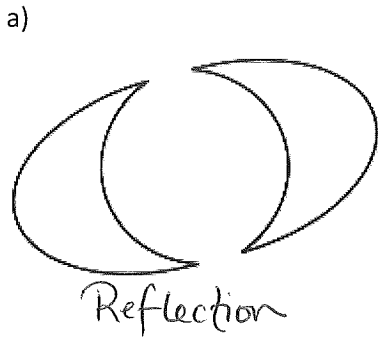


Multiple Choice Directions: Read through each question carefully. Circle ONE correct solution for each problem.

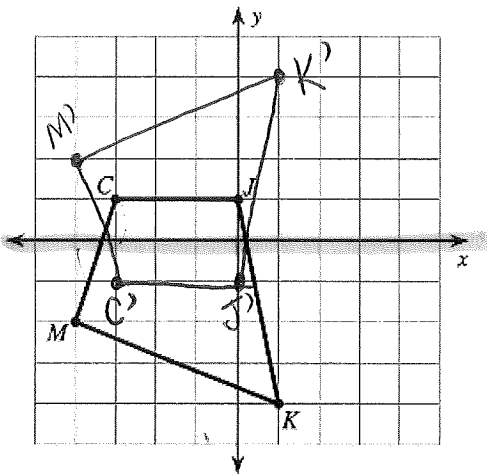
1. Label each of the following with either reflection, translation, rotation or dilation?



2. REFLECTIONS

You must be able to identify reflections from other transformations, and find their image in the coordinate plane over the x-axis, the y-axis, and any horizontal or vertical line.

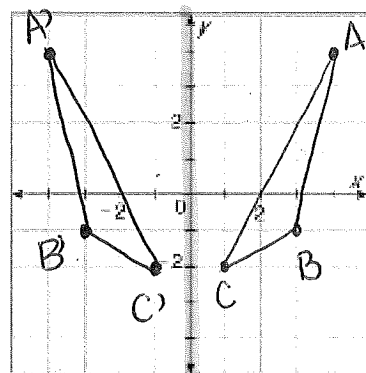
reflection across the x-axis $y=a$ $x=a$



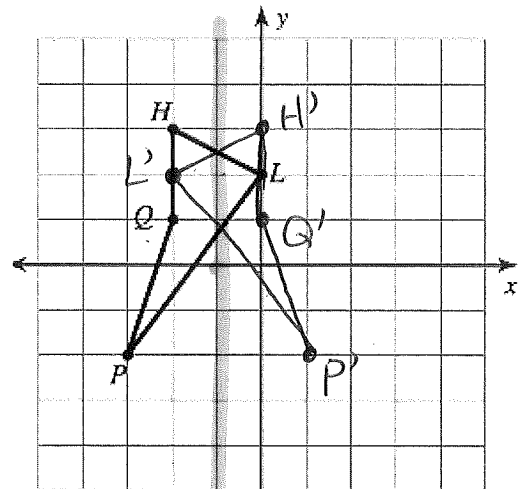
- $C' (-3, -1)$
- $J' (0, -1)$
- $M' (-4, 2)$
- $K' (1, 4)$

- $A' (-4, 4)$
- $B' (-3, -1)$
- $C' (-1, -2)$

$A(4, 4), B(3, -1), C(1, -2)$; y-axis



reflection across $x = -1$

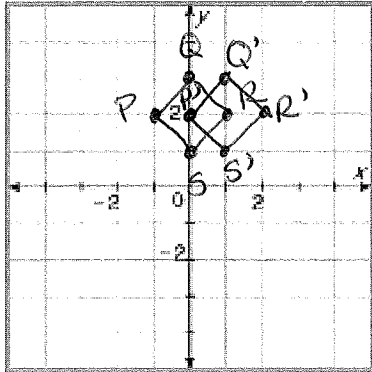


- $H' (0, 3)$
- $L' (-2, 2)$
- $P' (1, -2)$
- $Q' (0, 1)$

3. TRANSLATIONS

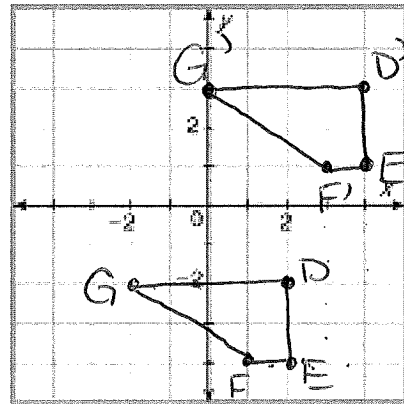
You must be able to identify translations from other transformations, and find their image in the coordinate plane given any vector $\langle a, b \rangle$ or using function notation $(x, y) \rightarrow (x + a, y + b)$

$P(-1, 2), Q(0, 3), R(1, 2), S(0, 1)$ $\langle 1, 0 \rangle$



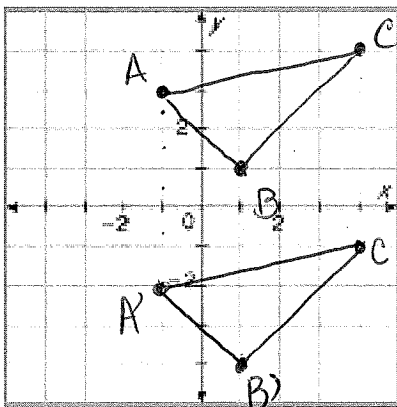
$P' \underline{(0, 2)}$
 $Q' \underline{(1, 3)}$
 $R' \underline{(2, 2)}$
 $S' \underline{(1, 1)}$

$D(2, -2), E(2, -4), F(1, -4), G(-2, -2); \langle 2, 5 \rangle$



$D' \underline{(4, 3)}$
 $E' \underline{(4, 1)}$
 $F' \underline{(3, 1)}$
 $G' \underline{(0, 3)}$

$A(-1, 3), B(1, 1), C(4, 4); (x, y) \rightarrow (x, y - 5)$

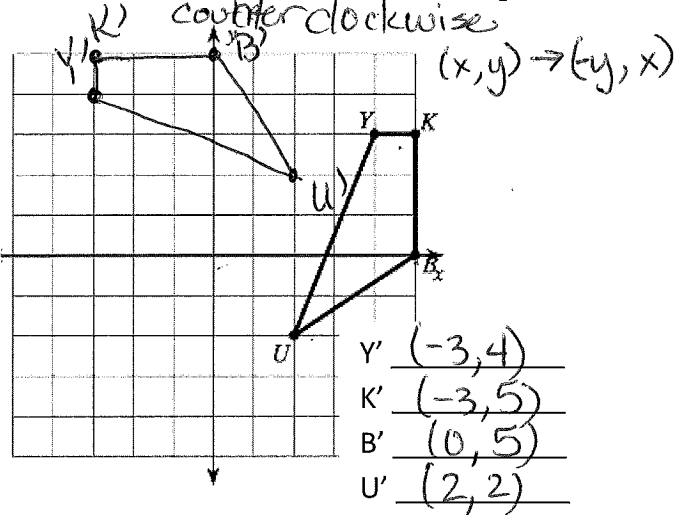


$A' \underline{(-1, -2)}$
 $B' \underline{(1, -4)}$
 $C' \underline{(4, -1)}$

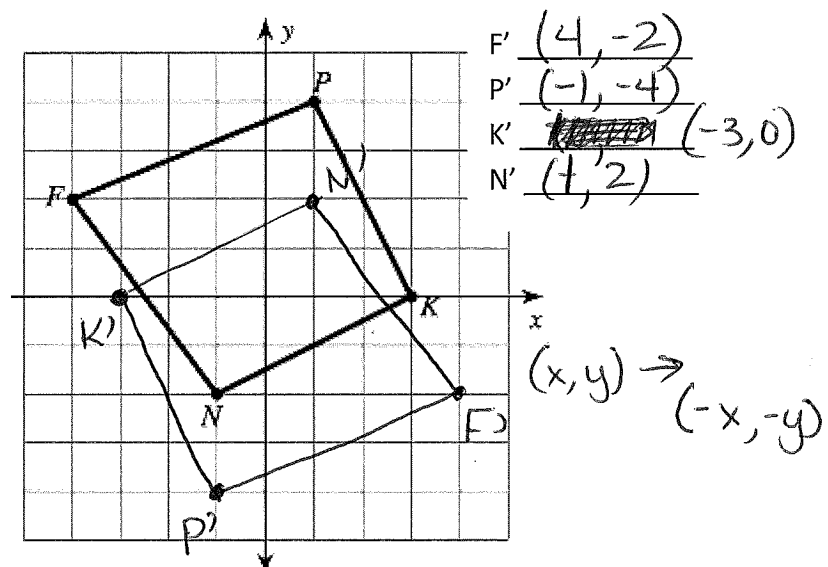
4. ROTATIONS

You must be able to identify rotations from other transformations, and find their image in the coordinate plane using the origin as the center of rotation and an angle of 90 or 180 degrees.

rotation 90° clockwise about the origin



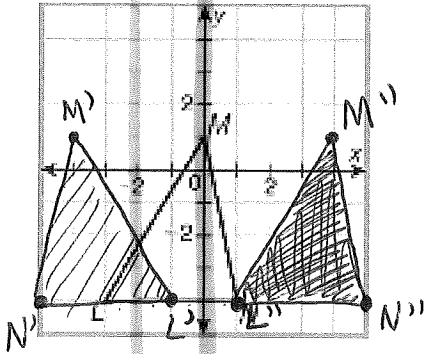
rotation 180° about the origin



5. COMPOSITIONS

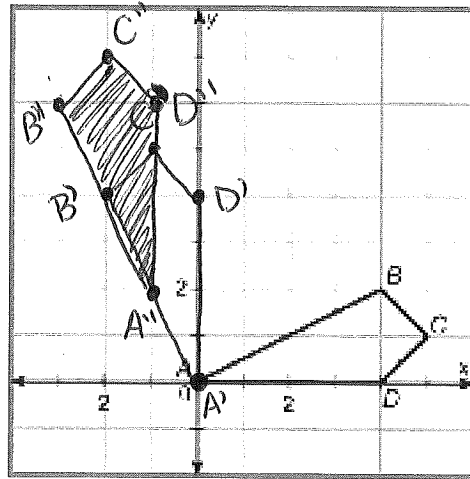
You must be able to identify the steps taken to compose a figure as well as perform compositions of various transformations in a given order.

$\triangle LMN$ is reflected across the line $x = -2$ and then reflected across the y -axis. What are the coordinates of the final image of $\triangle LMN$?



$L'' (1, -4)$ $M'' (1, 4)$ $N'' (5, -4)$

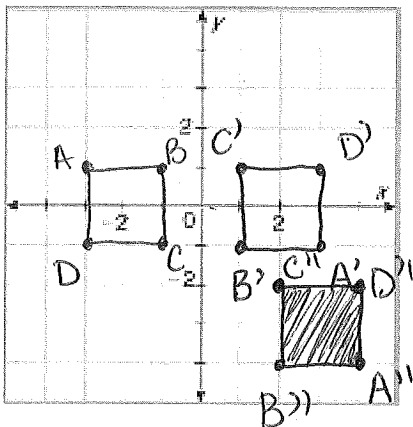
A pattern for a new fabric is made by rotating the figure 90° counterclockwise about the origin and then translating along the vector $\langle -1, 2 \rangle$. Draw the resulting figure in the pattern.



$(4, 2) \rightarrow (-2, 4)$
 $(5, 1) \rightarrow (-1, 5)$
 $(4, 0) \rightarrow (0, 4)$

$A'' (-1, 2)$ $B'' (-3, 6)$
 $C'' (-2, 7)$ $D'' (-1, 6)$

$ABCD$ has vertices $A(-3, 1)$, $B(-1, 1)$, $C(-1, -1)$, and $D(-3, -1)$. Rotate $ABCD$ 180° about the origin and then translate it along the vector $\langle 1, -3 \rangle$.

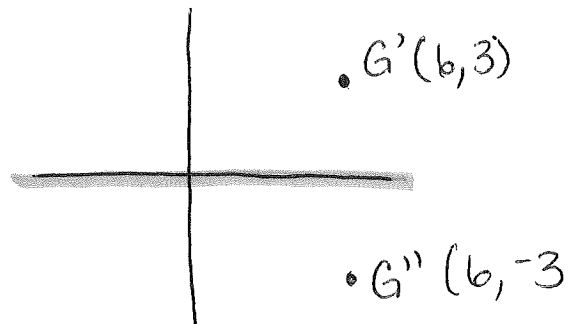


$A'' (4, -4)$ $B'' (2, -4)$
 $C'' (-2, -2)$ $D'' (4, -2)$

$\triangle EFG$ has vertices $E(1, 5)$, $F(0, -3)$, and $G(-1, 2)$. $\triangle EFG$ is translated along the vector $\langle 7, 1 \rangle$, and the image is reflected across the x -axis. What are the coordinates of the final image of G ?

- (A) $(6, -3)$ C $(-6, 3)$
- B $(6, 3)$ D $(-6, -3)$

$G(-1, 2) \rightarrow G'(6, 3)$
 $+7 \quad +1$



6. Dilations

You must be able to identify the scale factor and whether a problem is an enlargement or reduction. Also, you must be able to perform a dilation on a figure in a coordinate grid.

Given the dilation shown in the graph:

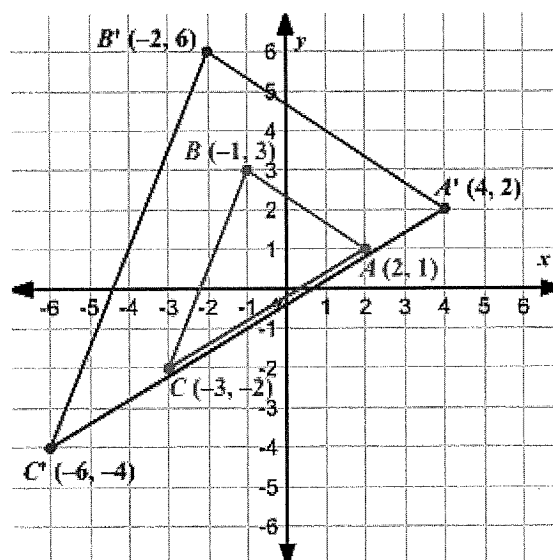
- a) Is this an enlargement or a reduction?

Enlargement

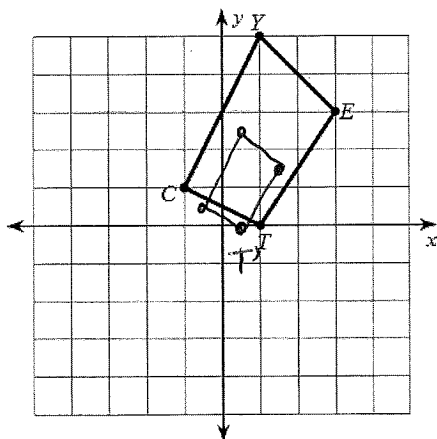
- b) What is the scale factor?

$$(-1, 3) \rightarrow (-2, 6)$$

$$\text{scale factor} = 2$$



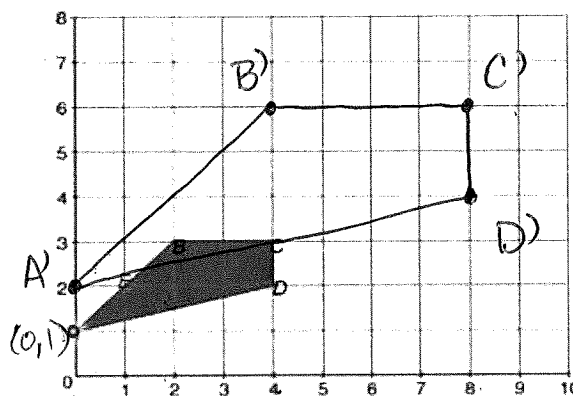
Dilate by a scale factor of 0.5



$$C(0.5, 0.5) \quad E(1.5, 1.5)$$

$$T(0.5, 0) \quad Y(0.5, 2.5)$$

Dilate by a scale factor of 2



$$A(0, 2) \quad B(4, 6)$$

$$C(8, 6) \quad D(8, 4)$$

CRITICAL THINKING

10. Miss Cogswell is using a coordinate grid to place furniture in a room. The position of a sofa is represented by a rectangle with vertices R (4, 4), E (2, 2), C (5, 5), and T (6, 6). She decides to move the sofa by translating it along the vector $\langle -5, 2 \rangle$. Give the coordinates of the sofa in its final position.

$$R'(-1, 6) \quad E'(-3, 4) \quad C'(0, 7) \quad T'(1, 8)$$

11. Nathan is watering his lawn with a rotational sprinkler that rotates 180° . If the sprinkler starts at the point (3, 4), what are the coordinates for the point where it will stop?

$$(3, 4) \rightarrow (-3, -4)$$