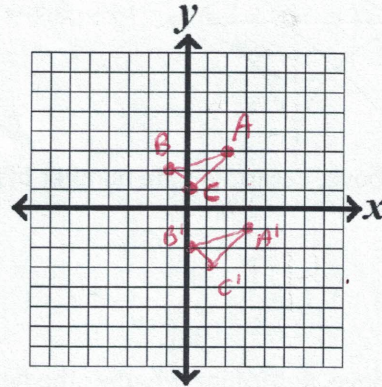


1. The vertices of $\triangle ABC$ are $A(2, 3)$, $B(-1, 2)$, and $C(0, 1)$. Translate $\triangle ABC$ using the vector $\langle 1, -4 \rangle$. Graph $\triangle ABC$ and its image, and list the new coordinates.

$A'(3, -1)$
 $B'(0, -2)$
 $C'(1, -3)$

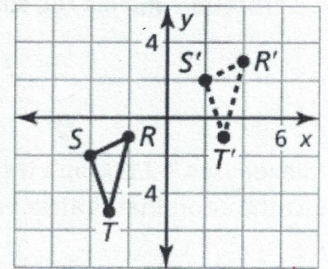


2. Find the component form of the vector that translates $A(3, -2)$ to $A'(-1, 4)$.

$(x-4, y+6)$
 $\langle -4, 6 \rangle$

3. Write a rule for the translation of $\triangle RST$ to $\triangle R'S'T'$.

$(x, y) \rightarrow (x+6, y+4)$
NOT $(x, y) \rightarrow (x+3, y+2)$



WATCH SCALING!
EACH BOX = 2

In Exercises 4 and 5, use the translation $(x, y) \rightarrow (x+1, y-3)$ to find:

4. Q' given $Q(5, 9)$

$Q(5, 9) \rightarrow Q'(6, 6)$

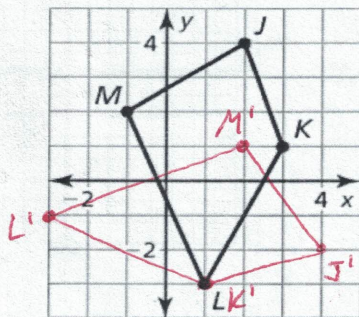
5. M given $M'(-3, -8)$

$M(-4, -5) \rightarrow M'(-3, -8)$

6. Graph the image of polygon JKLM after a 270° CCW rotation about the origin. List the coordinates of the image.

ORIGINAL POINTS

$J(2, 4)$
 $K(3, 1)$
 $L(1, -3)$
 $M(-1, 2)$

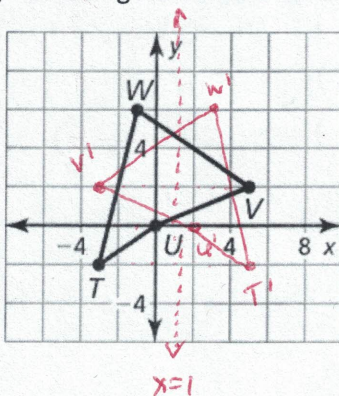


$(x, y) \rightarrow (y, -x)$

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

7. Graph the image of the figure below after a reflection over the line $x=1$. List the coordinates of the image.

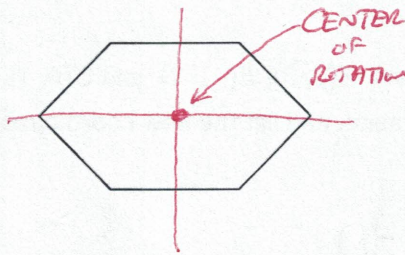
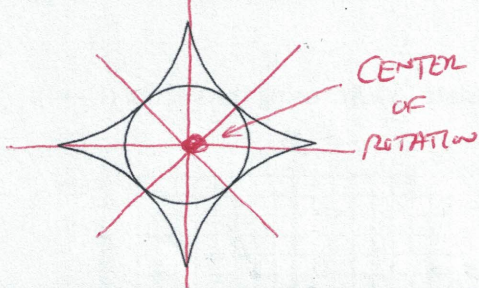
WATCH THE SCALING!



ORIGINAL POINTS

$T(-3, -2) \rightarrow T'(5, -2)$
 $U(0, 0) \rightarrow U'(2, 0)$
 $V(5, 2) \rightarrow V'(-3, 2)$
 $W(-1, 6) \rightarrow W'(3, 6)$

8. Use the figures below to answer parts (a) and (b).



a.) For each figure above, determine the number of lines of symmetry and draw them on the figure.

4

2

b.) For each figure above, determine whether the figure has rotational symmetry. If so, draw a point on the center of rotation and list the smallest degree rotation that maps the figure onto itself.

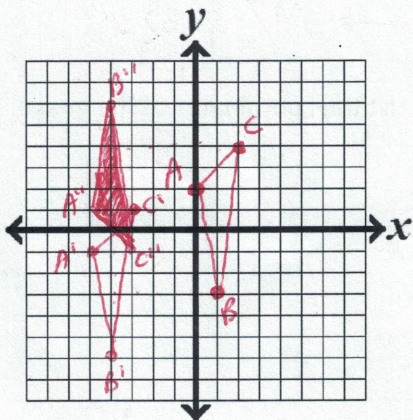
$90^\circ \left(\frac{360^\circ}{4} \right)$

$180^\circ \left(\frac{360^\circ}{2} \right)$

In exercises 9-11, graph the triangle with the given vertices. Then, perform the composition transformations listed. List the coordinates after each transformation.

9. $A(0, 2), B(1, -3), C(2, 4)$

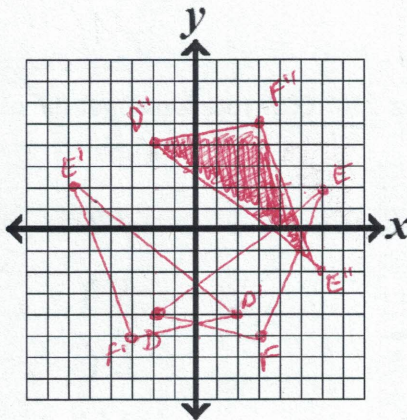
- $(x, y) \rightarrow (x-5, y-3)$
- Reflect over x-axis



$(x-5, y+3)$ $(x, -y)$
 $A'(-5, -1)$ $A''(-5, 1)$
 $B'(-4, -6)$ $B''(-4, 6)$
 $C'(-3, 1)$ $C''(-3, -1)$

10. $D(-2, -4), E(6, 2), F(3, -5)$

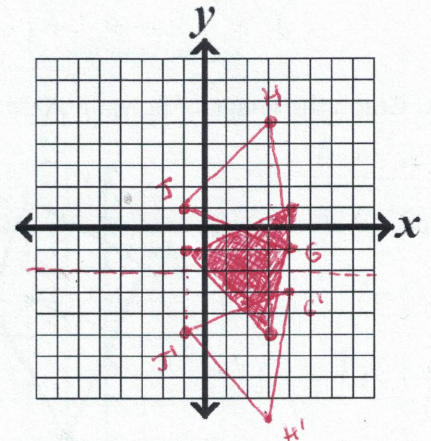
- Reflect over y-axis
- Rotate 180° CW around origin



$(-x, y)$ $(-x, -y)$
 $D'(2, -4)$ $D''(-2, 4)$
 $E'(-6, 2)$ $E''(6, -2)$
 $F'(-3, -5)$ $F''(3, 5)$

11. $G(4, -1), H(3, 5), J(-1, 1)$

- Reflect over line $y = -2$
- $(x, y) \rightarrow (x, y+4)$



$(x, -4-y)$ $(x, y+4)$
 $G'(4, -3)$ $G''(4, 1)$
 $H'(3, -9)$ $H''(3, -5)$
 $J'(-1, -5)$ $J''(-1, -1)$