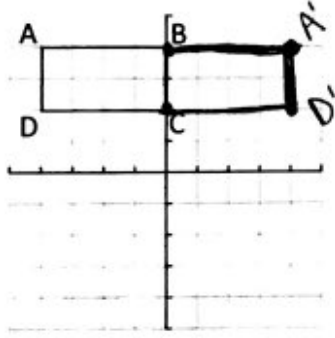
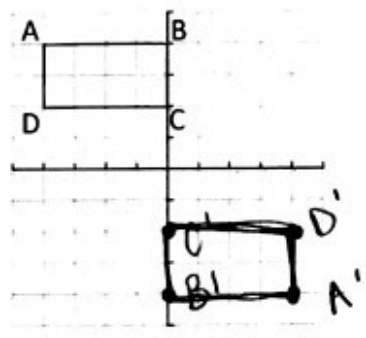
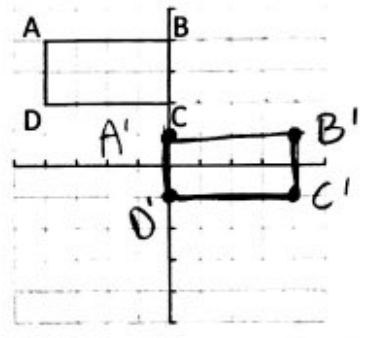


For each transformation, state the coordinates of the image of the point (1, 4) and the general rule for the image of the point (x, y).

	Image of (1, 4)	Image of (x, y)
1. Reflect over y-axis	$(-1, 4)$	$(-x, y)$
2. Reflect over x-axis	$(1, -4)$	$(x, -y)$
3. Reflect over $y = x$	$(4, 1)$	(y, x)
4. Reflect over $y = -x$	$(-4, -1)$	$(-y, -x)$
5. Rotate 90° CCW about the origin	$(-4, 1)$	$(-y, x)$
6. Rotate 270° CCW about the origin	$(4, -1)$	$(y, -x)$
7. Rotate 180° about the origin	$(-1, -4)$	$(-x, -y)$

For each of the following, graph and label the image for each transformation and then write the rule.

<p>8. Reflect over the line y axis</p>  <p>Rule: $(x, y) \rightarrow (-x, y)$</p>	<p>9. Rotate 180° about the origin</p>  <p>Rule: $(x, y) \rightarrow (-x, -y)$</p>	<p>10. Translate right 4 & down 3 units</p>  <p>Rule: $(x, y) \rightarrow (x+4, y-3)$</p>
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Answer each of the following.

- Find the image of $T(5, -3)$ under a transformation $(x, y) \rightarrow (x + 3, y - 5)$. $(8, -8)$
- M is reflected over the y-axis. If M is $(6, -1)$, find M' $(-6, -1)$
- C is rotated about the origin 90° ^{CCW}. If C is $(-9, 5)$, find C' $(-5, -9)$
- Y is rotated about the origin 180° . If Y is $(0, -3)$ find Y' $(0, 3)$
- A figure is reflected over the line $y = x$. If the preimage is $(2, 7)$, find the image. $(7, 2)$
- The only type of transformations that does not create a figure of the same size is: dilation

17. $\triangle ABC$ has vertices $A(5, -2)$, $B(-4, 0)$, $C(7, 1)$.
Find the coordinates of the image of the triangle if it is dilated by a scale factor of 2.

$A'(\underline{10}, \underline{-4})$

$B'(\underline{-8}, \underline{0})$

$C'(\underline{14}, \underline{2})$

18. $\triangle ABC$ has vertices $A(5, -2)$, $B(-4, 0)$, $C(7, 1)$.
Find the coordinates of the image of the triangle if it is reflected in the x-axis.

$A'(\underline{5}, \underline{2})$

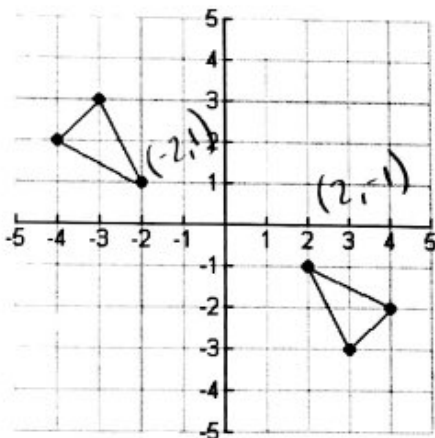
$B'(\underline{-4}, \underline{0})$

$C'(\underline{7}, \underline{-1})$

19. Consider the pre-image point $A(-4, -4)$. After a translation, A' is the points $(0, -12)$. Find the translation and write the algebraic rule to represent the translation that occurred.

Right 4
down 8 $(x, y) \rightarrow (x+4, y-8)$

20. Consider the following graph. Describe the transformation that is shown.



Rotate 180°

21. For each problem, there is a composition of motions. Using your algebraic rules, come up with a new rule after both transformations have taken place.

a. Translate a triangle 5 units left and 3 units up, and then reflect the triangle over the x-axis.

$(x, y) \rightarrow (x-5, -(y+3))$

b. Reflect in the line $y = x$, and then translate left 4 units and down 2 units.

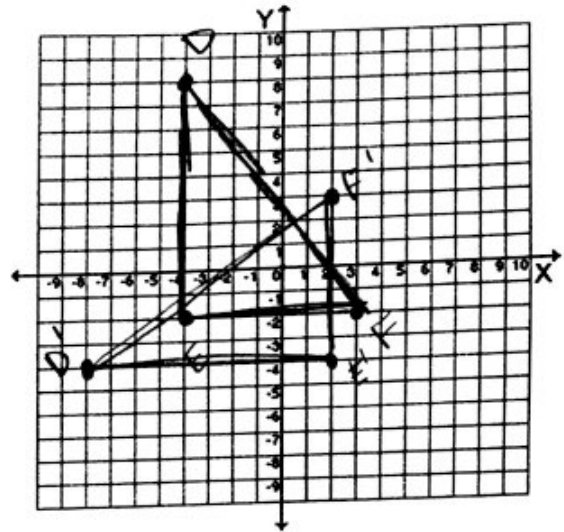
$(x, y) \rightarrow (y-4, x-2)$

22. The vertices of a triangle are D(-4, 8), E(-4, -2) and F(3, -2). Name the vertices of the image rotated 90 degrees counter-clockwise

$D'(-8, -4)$ $E'(2, -4)$ $F'(2, 3)$

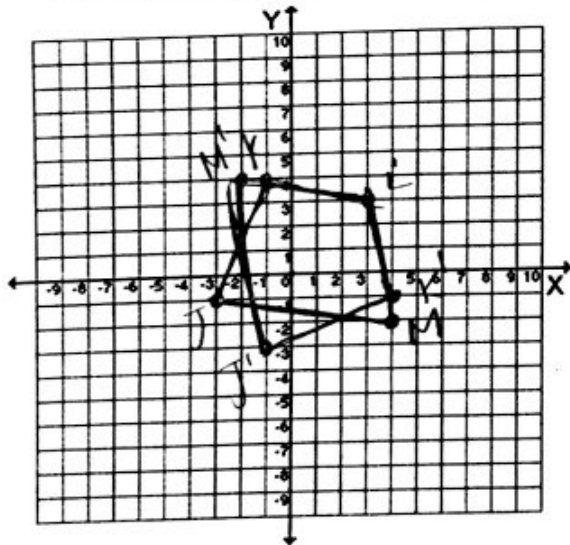
Algebraic Rule:

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



23. Graph the points J(-3, -1), K(-1, 4), L(3, 3) and M(4, -2) and then reflect over the line y=x.

Label the images and write the algebraic rule.



$J'(-1, -3)$ $K'(4, -1)$

$L'(3, 3)$ $M'(-2, 4)$

Algebraic Rule:

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