

Chapter 3 Review – Transformations

Name: _____

Review Section:

1. Given $\triangle ABC$ has vertices at $A(0, -4)$, $B(2, -1)$, $C(5, 0)$. $(x, y) \rightarrow (-x, y)$

a. Find the vertices of the image of $\triangle ABC$ under $R_{y\text{-axis}}$

$A'(\underline{0}, \underline{-4})$ $B'(\underline{-2}, \underline{-1})$ $C'(\underline{-5}, \underline{0})$

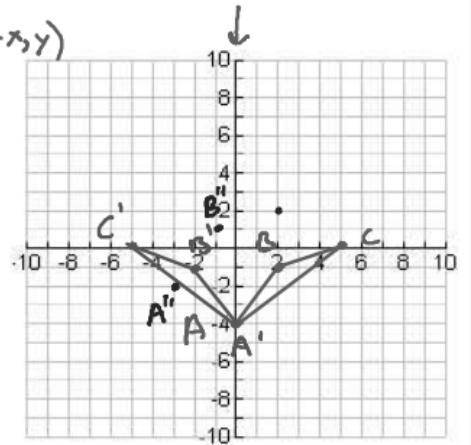
b. Find the image of the point B under a $r_{(270^\circ, 0)}$ $(x, y) \rightarrow (y, -x)$

$(\underline{-1}, \underline{-2})$

c. Find the coordinates of the image of $\triangle ABC$ under the transformation defined by $T_{(-3, 2)}$ 3 Left Up 2

$(\underline{0}, \underline{4})$ $A'(\underline{-3}, \underline{-2})$ $B'(\underline{-1}, \underline{1})$ $C'(\underline{2}, \underline{2})$

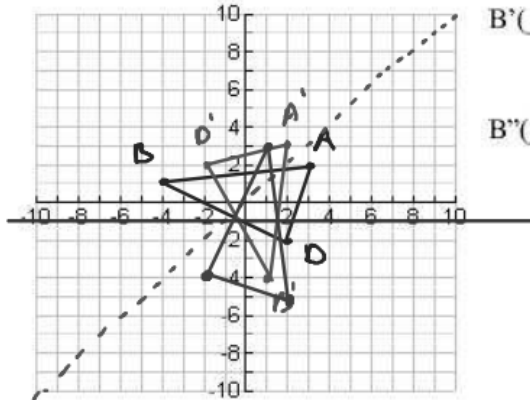
$(\underline{0-3}, \underline{-4+2})$



2. Given $\triangle BAD$ with $B(-4, 1)$, $A(3, 2)$, and $D(2, -2)$ use the following transformation

$(R_{y=-1} \circ R_{y=x})$
2nd 1st

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

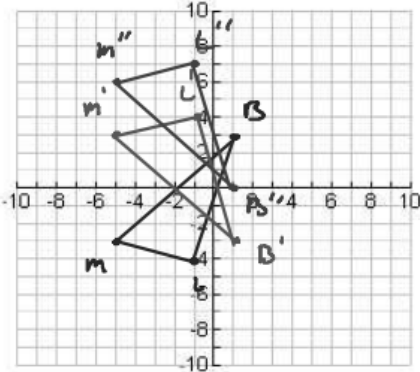


$B'(\underline{1}, \underline{-4})$ $A'(\underline{2}, \underline{3})$ $D'(\underline{-2}, \underline{2})$

$B''(\underline{1}, \underline{3})$ $A''(\underline{2}, \underline{-5})$ $D''(\underline{-2}, \underline{-4})$

$$180^\circ \downarrow (x,y) \rightarrow (x,-y)$$

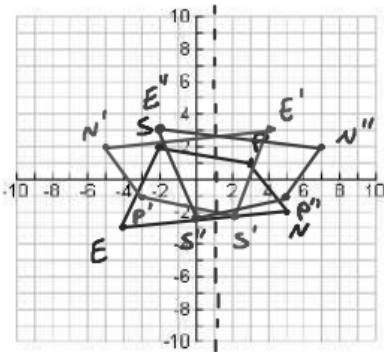
3. Given $\triangle MLB$ $M(-5,-3)$, $L(-1,-4)$, and $B(1,3)$ ($T_{(0,3)} \circ R_{x-axis}$)



$$M'(-5, 3) \quad L'(-1, 4) \quad B'(1, -3)$$

$$M''(-5, 6) \quad L''(-1, 7) \quad B''(1, 0)$$

4. Given quadrilateral $ESPN$ with $E(-4, -3)$, $S(-2, 2)$, $P(3, 1)$, and $N(5, -2)$, ($R_{x=1} \circ r_{(180^\circ, 0)}$) $\downarrow (x,y) \rightarrow (-x,-y)$



$$E'(4, 3) \quad S'(2, -2) \quad P'(-3, -1) \quad N'(-5, 2)$$

$$E''(2, 3) \quad S''(0, -2) \quad P''(5, -1) \quad N''(7, 2)$$

5. Refer to the coordinate grid below. The scale on each axis is one.

a. Describe and write a rule for a composite transformation that will map $\triangle ABC$ onto $\triangle DEF$.

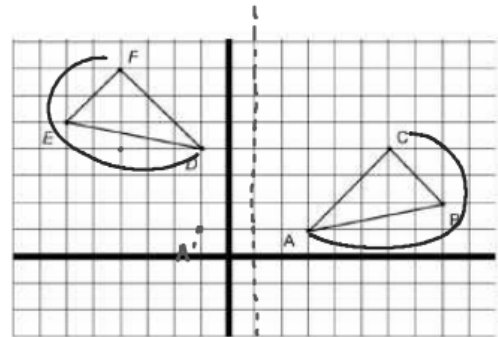
Rotation
Reflection
Translation

Reflection over $x=1$
followed by a translation up 3

b. Which point of $\triangle ABC$ is the image of point B under your composite transformation from Part b?

E

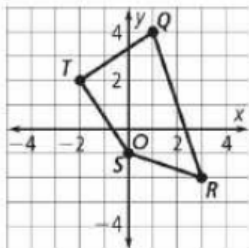
$(-6, 5)$



$$(T_{(0,3)} \circ R_{x=1})(\triangle ABC)$$

$$Q(1,4) \quad R(3,-2) \quad S(0,-1) \quad T(-2,2)$$

6. Find the coordinates of the vertices of each image.



a. $R_{y=x}(QRST) \quad (x,y) \rightarrow (y,x)$

$Q' (4,1)$

$R' (-2,3)$

$S' (-1,0)$

$T' (2,-2)$

b. $r_{(270^\circ,0)}(QRST) \quad (x,y) \rightarrow (y,-x)$

$Q' (4,-1)$

$R' (-2,-3)$

$S' (-1,0)$

$T' (2,2)$

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

$(x,y) \rightarrow (x-3, y-1)$

c. $T_{(-3,-1)}(QRST)$

$Q' (-2,3)$

$R' (0,-3)$

$S' (-3,-2)$

$T' (-5,1)$

d. $(R_{y=-x} \circ T_{(-2,-1)})(QRST)$

$Q' (-3,1)$

$R' (3,-1)$

$S' (3,2)$

$T' (-1,4)$

7. A reflection over $x = -4$ followed by a reflection over $x = 6$ result in a translation in the direction of UP DOWN LEFT **RIGHT** a total distance 20

8. A reflection over $y = 6$ followed by a reflection over $y = -8$ result in a translation in the direction of UP **DOWN** LEFT RIGHT a total distance of 28

9. If you wanted to translate a shape to the right 20 units, you could reflect over $x = -5$ and then $x =$ _____

$x = 5$

10. If you want to translate a shape down 16 units, you could reflect over $y = -5$ and then $y =$ _____

$y = -13$

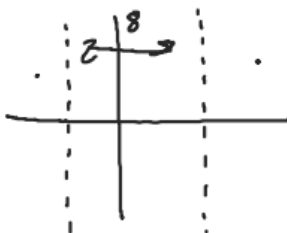
11. If you want to translate a shape right 24 units, you could reflect over $x = -5$ and then $x = 7$.

12. Suppose m is the line $x = 6$ and n is the line $x = -2$. Write the following composition as one translation

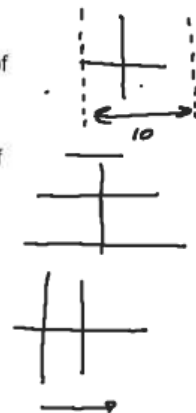
$R_m \circ R_n$

$R_m \circ R_n = T(\quad)$

$T\langle 16, 0 \rangle$



16



13. Find a translation that has the same effect as the composition of translations below.

$T_{\langle -3, 6 \rangle}(x, y)$ followed by $T_{\langle -7, -4 \rangle}(x, y)$

$$T_{\langle -3+(-7), 6+(-4) \rangle}$$

$$T_{\langle -10, 2 \rangle}$$

14. Point $P'(7, -4)$ is the image of point $P(5, -8)$ under a translation. What is the image of $(0, -6)$ under the same translation?

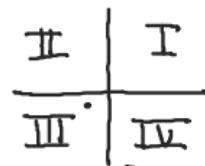
$$T_{\langle 2, 4 \rangle}$$

$$(2, -2)$$

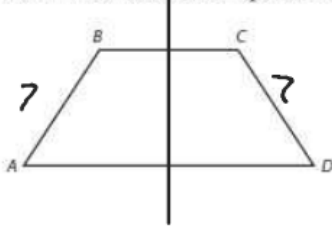
15. The rule $T_{\langle -4, 6 \rangle}$ is used for point $(2, -7)$. Which quadrant is the translated point in the coordinate system?

III

$$(-2, -1)$$



16. In the isosceles trapezoid below, $AB = BC = CD = 7$ centimeters.



a. Identify all, if any reflection symmetries. If there are reflections, draw or describe the line(s) of reflection. Describe any angle(s) of rotation for the figure.

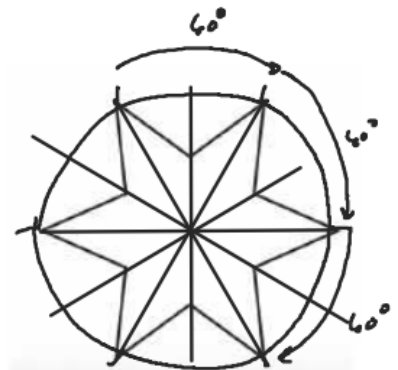
connect midpt of \overline{BC} and \overline{AD}

17. Identify any reflection or/and rotational symmetry. On either, draw the line(s) of symmetry and describe the angle(s) of rotation.

6 lines of symmetry

$60^\circ, 120^\circ, 180^\circ, 240^\circ, 300^\circ$

$$\begin{array}{r} 60 \\ 6 \overline{) 360} \\ \underline{36} \\ 00 \end{array}$$



18. Which words have horizontal reflection symmetry?

(A) ~~COOKBOOK~~ (B) ~~BOB~~ (C) ~~ROB~~ (D) ~~SEEK~~

19. Give the coordinates of the image of the point $(-6, 3)$ under the given transformation.

Transformation	New Coordinates
$r_{(90^\circ, 0)}$	$(-3, -6)$
$R_{y=-x}$	$(-3, 6)$
$T_{(0, -8)}$ ($R_{y=0} \circ R_{y=4}$) What single rule would work as well?	$(-6, -5)$
$(r_{(180^\circ, 0)} \circ r_{(270^\circ, 0)})$ What single rotation could you do?	$(-3, -6)$
$T_{(8, -5)}$	$(2, -2)$
$(R_{y=x}) \circ T_{(-2, 4)}$ $(x, y) \rightarrow (y, x)$	$(-8, 7)$ $(7, -8)$

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

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

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

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

$$(3, 6) \left. \begin{array}{l} \\ \\ \end{array} \right\} r_{(90^\circ, 0)}$$

20. Use the diagram to describe the transformation for each of the following.

a. Pre-image: Shape I

Image: Shape II

$$r_{(270^\circ, 0)}$$

$$(-5, 3) \rightarrow (3, 5)$$

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

b. Pre-image: Shape II

Image: Shape III

$$R_{y=-x}$$

$$(3, 5) \rightarrow (-5, -3)$$

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

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

c. Pre-image: Shape IV

Image: Shape II

$$r_{(270^\circ, 0)}$$

$$(3, 5) \rightarrow (5, -3)$$

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

d. Pre-image: Shape I

Image: Shape IV

$$r_{(180^\circ, 0)}$$

$$(-5, 3) \rightarrow (5, -3)$$

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

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

e. Preimage: Shape I

Image: Shape III

$$R_{y=-x}$$

$$(-5, 3) \rightarrow (-5, -3)$$

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

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

