

Fill in the blank.

**Reflections**

$r_{x\text{-axis}}(x, y) \rightarrow \underline{(x, -y)}$

$r_{y\text{-axis}}(x, y) \rightarrow \underline{(-x, y)}$

$r_{y=x}(x, y) \rightarrow \underline{(y, x)}$

$r_{y=-x}(x, y) \rightarrow \underline{(-y, -x)}$

**Rotations:**

$r_{90^\circ \text{CW or } 270^\circ \text{CCW}}(x, y) \rightarrow \underline{(y, -x)}$

$r_{90^\circ \text{CCW or } 270^\circ \text{CW}}(x, y) \rightarrow \underline{(-y, x)}$

$r_{180^\circ}(x, y) \rightarrow \underline{(-x, -y)}$

memorize!!!

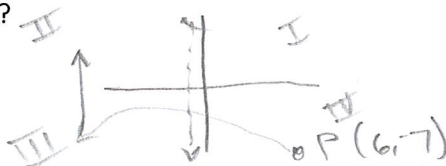
1. What type of transformation moves
- $P(1, -7)$
- to
- $P'(-7, 1)$
- ?

swapping  $x$  &  $y$   
Reflect in  $y=x$ 

2. If the result of
- $(x, y) \rightarrow (x-1, y+3)$
- is
- $T'(2, 3)$
- , what is the
- pre-image**
- , or
- $T$
- ?

Go backwards!  $\frac{+1}{-3}$   
 $T(3, 0)$ 

3. If
- $P(6, -7)$
- is reflected over the line
- $x = -1$
- and then translated according to the rule
- $(x, y) \rightarrow (x-1, y+10)$
- , what quadrant will
- $P''$
- be in?



Quadrant II

4. If
- $T(-4, -5)$
- is reflected across the
- $x$
- axis, what is the resulting coordinate of
- $T'$
- ?

$T'(-4, 5)$

5. An
- Isometry**
- is a transformation that results in a figure that is congruent to the original one? Name 3 transformations that are Isometries.

(a)

Reflection

(b)

Rotation

(c)

Translation

6. What other transformations would produce the same image as one rotated
- $90^\circ$
- counterclockwise?

Rotate  $270^\circ$  Clockwise

7. A figure is transformed according to the rule
- $(x, y) \rightarrow (x+3, y-2)$
- . What transformation has taken place?

Translate right 3 &amp; down 2

8. Given
- $A(3, -5)$
- , if
- $A$
- is transformed by the rule
- $(x, y) \rightarrow (x+1, y-4)$
- and then reflected over the
- $y$
- axis, what is
- $A''$
- ?

$A(3, -5) \quad A'(4, -9) \quad A''(-4, -9)$

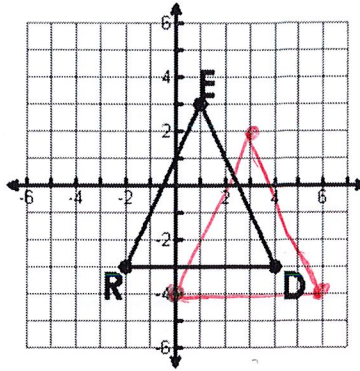
## Open-Ended Questions

9. Translate the figure by
- $(x + 2, y - 1)$

$$R(-2, 3) \rightarrow R'(0, -4)$$

$$E(1, 3) \rightarrow E'(3, 2)$$

$$D(4, -3) \rightarrow D'(6, -4)$$

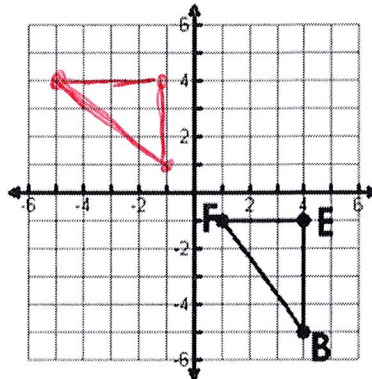


10. Reflect the figure over the line
- $y = x$
- .

$$F(1, -1) \rightarrow F'(-1, 1)$$

$$E(4, -1) \rightarrow E'(-1, 4)$$

$$B(4, -5) \rightarrow B'(-5, 4)$$

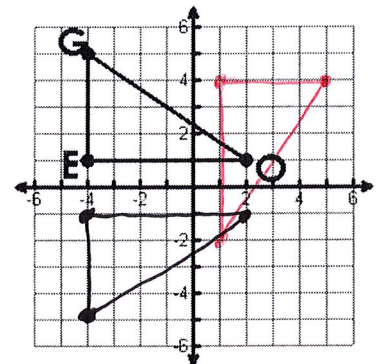


11. Rotate
- $90^\circ$
- clockwise around the origin, then reflect over
- $y = -x$
- .

$$G(-4, 5) \rightarrow G'(5, 4) \rightarrow G''(-4, -5)$$

$$E(-4, 1) \rightarrow E'(1, 4) \rightarrow E''(-4, -1)$$

$$O(2, 1) \rightarrow O'(1, -2) \rightarrow O''(2, -1)$$



The vertices of  $\triangle ABC$  are  $A(-1, 0)$ ,  $B(-4, 3)$ , and  $C(-4, -3)$ . Three transformations are performed on this triangle. The first is a transformation of the reflection of  $\triangle ABC$  through the  $y$ -axis. Then it is translated left 1 unit and down 4 units. Finally, the triangle is rotated  $270^\circ$  counter-clockwise.

12. What is the rule for each transformation?

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

$$(2) (x, y) \rightarrow (x - 1, y - 4)$$

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

13. Graph all of them on the given graph. Don't forget to label All points.

