Directions: Using the rule provided, describe the transformation or sequence of transformations that have occurred.

1) $(x, y) \rightarrow$ " $(y, x+2)$
2) $(x, y) \rightarrow{ }^{\prime}(-y,-x)$
3) $(x, y) \rightarrow$ " $(-x, 3 y)$
4) $(x, y) \rightarrow{ }^{\prime}(-y, x)$

Directions: Write the rule to represent the transformation.
5) Rotate $180^{\circ} \mathrm{CW}$ about the origin
7) Translate 4 units left and 8 units up
9) Rotate $270^{\circ} \mathrm{CCW}$ about the origin
6) Horizontal stretch of 10
8) Reflect over $y=x$
10) Dilate by a scale factor of $\frac{1}{3}$

## Directions: Graph the transformation using the given information.

11) $(x, y) \rightarrow(x, 1.5 y)$

12) Dilate by $\frac{1}{2}$; then, reflect over $x=1$

13) Rotate $180^{\circ} \mathrm{CW}$ about $(-1,0)$


## Directions: Solve each problem.

14) If $Z(3,-4)$, what is $Z^{\prime \prime}$ after it has been rotate $180^{\circ} \mathrm{CW}$ and then vertically stretched by 5 ?
15) If $R^{\prime}(0,5)$, what is $R$ if the following rule was used to produce the image: $(x, y) \rightarrow{ }^{\prime}(-y,-x)$ ?
16) If $J(3,1)$ is reflected over $y=x$, dilated by 3 with a center at $(1,2)$, and then rotated $90^{\circ} \mathrm{CCW}$, what is $J^{\prime \prime \prime}$ ?

Directions: Describe the sequence of transformations.
17) $(x, y) \rightarrow$ ' $(x-2, y) \rightarrow$ " $(y, x-2) \rightarrow{ }^{\prime \prime \prime}(-y, x-2)$
18) $(x, y) \rightarrow{ }^{\prime}(6 x, y) \rightarrow$ "( $\left.-y, 6 x\right) \rightarrow$ "'( $\left.-6 x, y\right)$
19)


Directions: Determine how to map the pre-image onto the image.
20)

21)


Directions: Determine how to map the pre-image onto itself using the given number of transformations.

22) 1 transformation
23) 2 transformations
24) 3 transformations

