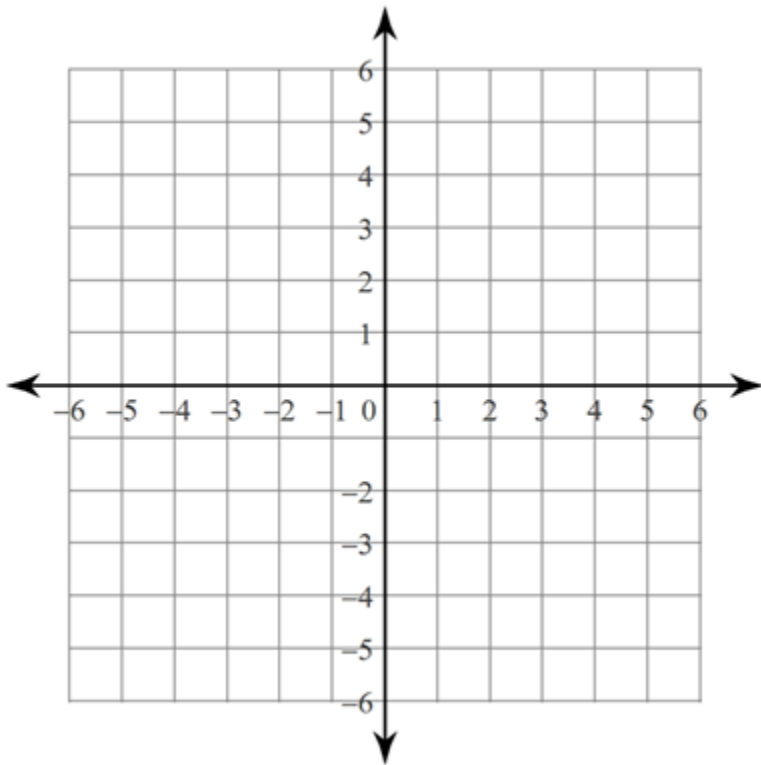


Combining Transformations

Graph the function $y = |x|$. Apply the following transformations in the order they are given. After each step, use mapping notation to describe the transformation from the original function.

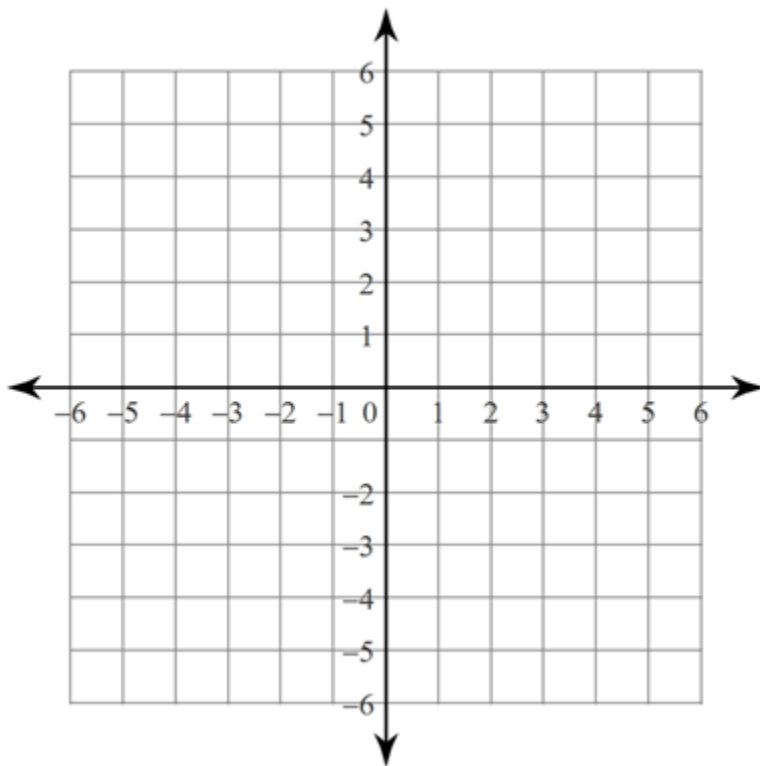
- A vertical stretch by a factor of 3.
- A horizontal stretch by a factor of 2.



Mapping Notation:

Graph the function $y = |x|$. Apply the following transformations in the order they are given. After each step, use mapping notation to describe the transformation from the original function.

- A horizontal stretch by a factor of 2.
- A vertical stretch by a factor of 3.

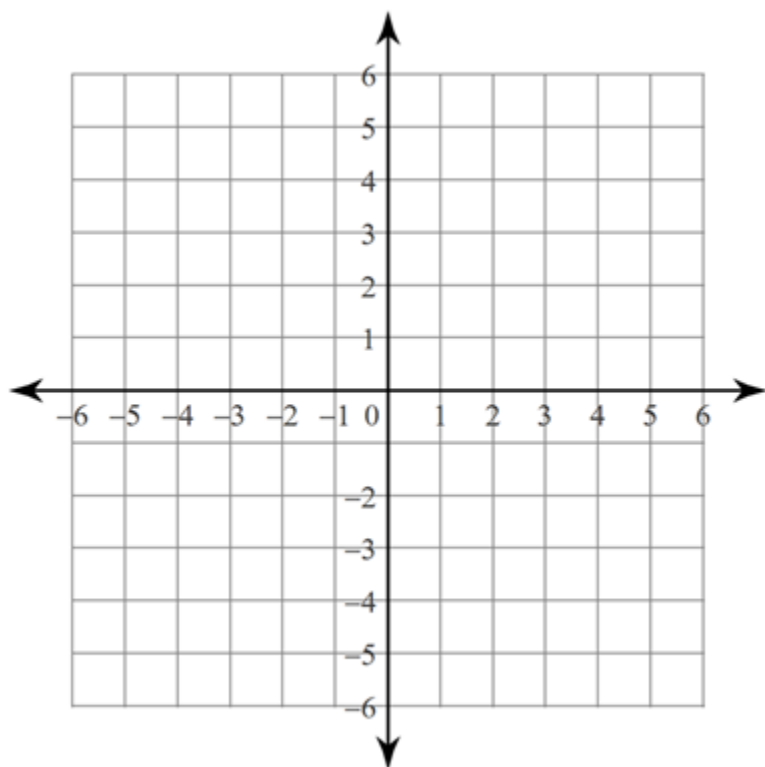


Mapping Notation:

Did the order in which you performed the stretches change the resulting image?

Graph the function $y = x^2$. Apply the following transformations in the order they are given. After each step, use mapping notation to describe the transformation from the original function.

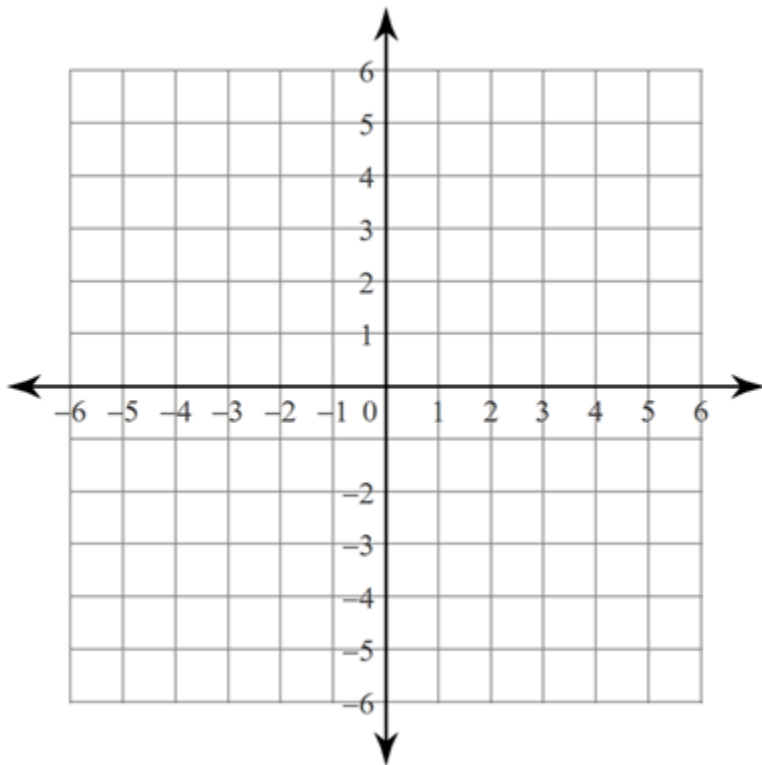
- A vertical translation of 2 down.
- A vertical stretch by a factor of 2.



Mapping Notation:

Graph the function $y = x^2$. Apply the following transformations in the order they are given. After each step, use mapping notation to describe the transformation from the original function.

- A vertical stretch by a factor of 2.
- A vertical translation of 2 down.



Mapping Notation:

Did the order in which you performed the stretches change the resulting image?

When applying several transformations to a function, _____ must be done before _____.

A transformed function can be written in the form $y = af(b(x - h)) + k$.

A function written in this form has undergone the following transformation:

Example 1

The function $y = f(x)$ is transformed to the function $g(x) = -2f(2x + 6) - 1$.

Describe the transformations that were applied to $y = f(x)$.

Example 2

A key point $(-1, 2)$ lies on the graph $y = f(x)$. What is its image point under the following transformation of the graph of $y = f(x)$?

$$y - 1 = \frac{1}{2}f\left(-\frac{1}{3}x - 1\right)$$

Example 3

The graph of $y = f(x)$ is given. Sketch the graph of $y + 2 = -f\left(\frac{1}{2}(x + 2)\right)$.

