

# Assignment

## Write

Given a basic function  $y = f(x)$  and a function written in transformation form  $g(x) = A \cdot f(x-C) + D$ , describe how the transformations that are inside a function affect a graph differently than those on the outside of the function.

## Remember

The basic absolute value function is  $f(x) = |x|$ .

The transformed function  $y = f(x) + D$  shows a vertical translation of the function.

The transformed function  $y = Af(x)$  shows a vertical dilation of the function when  $A > 0$  and when  $A < 0$  it shows a vertical dilation and reflection across the  $x$ -axis.

The transformed function  $y = f(x - C)$  shows a horizontal translation of the function.

## Practice

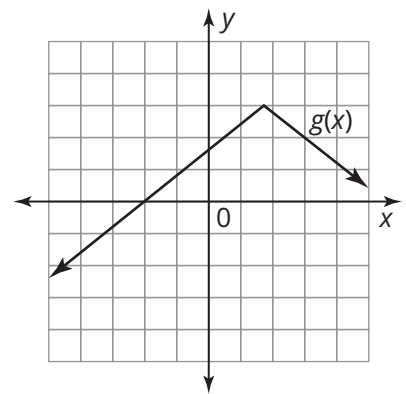
Given the basic function  $f(x) = |x|$ . Consider each transformation. Describe how the transformations affected  $f(x)$ . Then use coordinate notation to describe how each point  $(x, y)$  on the graph of  $f(x)$  becomes a point on the graph the transformed function. Finally, sketch a graph of each new function.

- $g(x) = \frac{1}{3}f(x) - 2$
- $j(x) = 2f(x + 1) + 4$
- $m(x) = -\frac{1}{2}f(x - 3) - 1$
- $p(x) = -f(x + 4) + 3$

## Stretch

The function  $g(x)$  shown is a transformation of  $f(x) = |x|$ .

Write the function  $g(x)$  in terms of  $f(x)$ .



## Review

1. The TransAmerica Pyramid is the second highest building in San Francisco. It is shaped like a pyramid with a square base. The side length of the base is 175 feet, and the building is 853 feet tall. What is the volume of the TransAmerica Pyramid?
2. A perfume manufacturer is considering new bottles for one of their perfumes. The bottles are cylinder-shaped with a diameter of 9 centimeters and a height of 10 centimeters. How much perfume will the bottle hold? Use 3.14 for  $\pi$  and round your answer to the nearest tenth if necessary.
3. In circle  $M$  shown, the length of  $\widehat{PW}$  is  $18\pi$  centimeters and  $m\angle PRW$  is  $56^\circ$ . Determine the length of the diameter of circle  $M$ . Round your answer to the nearest hundredth.
4. The measure of a central angle is  $65^\circ$ . The length of the radius is 25 cm. Determine the length of the arc intercepted by the central angle.
5. Write the equation of a line that passes through the point  $(-4, 3)$  and is parallel to the line  $3x - 4y = 8$ .
6. Write the equation of a line that passes through the point  $(-7, 11)$  and is perpendicular to the line  $3x + 15y = -20$ .

