

# Assignment

## Write

Describe the term *basic function* in the context of transformations using your own words.

## Remember

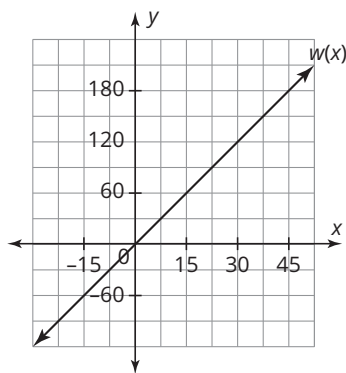
For the basic function  $f(x) = x$ , the transformed function  $y = f(x) + D$  shows a vertical translation of the function. For  $D > 0$ , the resulting graph vertically shifts up. For  $D < 0$ , the resulting graph vertically shifts down. The basic function and the resulting graph are parallel because they have the same slope but different  $y$ -intercepts.

The transformed function  $y = Af(x)$  shows a vertical dilation of the function. For  $|A| > 1$ , the resulting graph vertically stretches by a factor of  $A$  units. For  $0 < |A| < 1$ , the resulting graph vertically compresses by a factor of  $A$  units. For  $A < 0$ , the resulting graph is vertically stretched or compressed and is reflected across the  $x$ -axis.

## Practice

1. Given  $w(x) = 4x$ .

a. Graph  $r(x) = \frac{1}{2} \cdot w(x)$ . Then complete the table of corresponding points on  $r(x)$ .



$x$	$w(x)$	$r(x)$
0		
15		
30		
45		

b. Describe the transformation performed on  $w(x)$  to produce  $r(x)$ .

c. Write the equation for the function  $r(x)$  in general form.

2. Write the equation of a line parallel to the line  $y = 2x$  that passes through the given points.

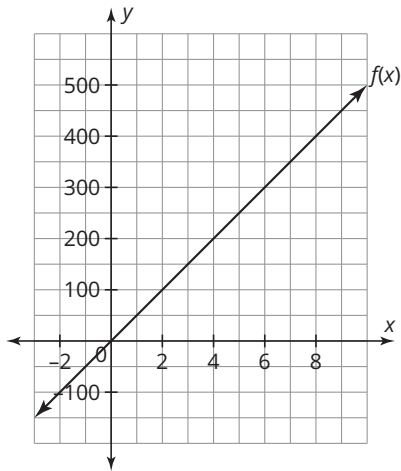
a.  $(0, 4)$

b.  $(-2, -1)$

c.  $(2, 0)$

3. Given  $f(x) = 50x$ .

a. Graph  $b(x) = f(x) - 150$ . Then complete the table of corresponding points on  $b(x)$ .



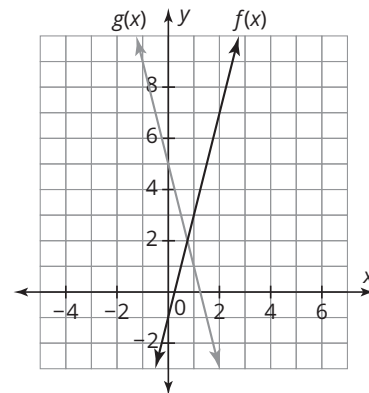
$x$	$f(x)$	$b(x)$
2		
4		
6		
8		

b. Write the equation for the function  $b(x)$  in general form.

c. Describe the transformation performed on  $f(x)$  to produce  $b(x)$ .

## Stretch

The functions  $f(x)$  and  $g(x)$  are shown on the graph. Write an equation for each function in general form. Then write an equation for  $g(x)$  in terms of  $f(x)$ .



## Review

1. Brody works as a fly-fishing guide. The table indicates the number of fish caught on each expedition he guided in a week and the amount of the tip he received for each expedition.

- Construct a scatter plot of the data.
- Based on the shape of the scatter plot, is a linear regression appropriate? What type of correlation appears to be present?
- Use technology to write a function to represent the line of best fit.
- Compute and interpret the correlation coefficient.

2. Determine whether each table of values represents a linear function. If so, write the function. If not, explain why.

a.

$x$	$y$
2	3
4	4
6	5
8	6

b.

$x$	$y$
-4	-17
-2	-9
2	7
4	17

Number of Fish Caught	Amount of Tip (\$)
22	125
19	80
25	130
26	150
21	100
18	75
27	150