

## Exercise 59

If  $g(x)$  is the transformation of  $f(x) = x$  after a vertical compression by  $\frac{3}{4}$ , a shift right by 2, and a shift down by 4

- Write an equation for  $g(x)$ .
  - What is the slope of this line?
  - Find the  $y$ -intercept of this line.
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### Solution

Start with the parent function,

$$f(x) = x.$$

Multiply it by  $3/4$  to vertically compress it by  $3/4$ .

$$\frac{3}{4}x$$

To shift it to the right by 2, replace  $x$  with  $x - 2$ .

$$\frac{3}{4}(x - 2)$$

Finally, to shift it down by 4, subtract 4 from it.

$$\begin{aligned}g(x) &= \frac{3}{4}(x - 2) - 4 \\&= \frac{3}{4}x - \frac{3}{2} - 4 \\&= \frac{3}{4}x - \frac{11}{2}\end{aligned}$$

The slope of this line is  $3/4$ , and the  $y$ -intercept is  $(0, -11/2)$ .

