

Given the parent function

$$y = f(x),$$

Vertical stretch or compression

Horizontal stretch or compression

$$y = a \cdot f(x)$$

if $|a| > 1$; stretch away from x -axis,
if $0 < |a| < 1$; compression toward x -axis

$$y = f\left(\frac{1}{b} \cdot x\right)$$

if $|b| > 1$; stretch away from y -axis,
if $0 < |b| < 1$; compression toward y -axis

a and b can cause a stretch or compression on $f(x)$

Given the parent function

$$y = f(x),$$

Given the following functions, determine the value of a and b .

$$y = 4 \cdot f(x)$$

$$y = f(3x)$$

$$y = \frac{1}{3} \cdot f(x)$$

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

Given the parent function

$$y = f(x),$$

Given the following functions, determine the value of a and b .

$$y = 3x^2$$

$$y = (4x)^2$$

$$y = \frac{1}{5}|x|$$

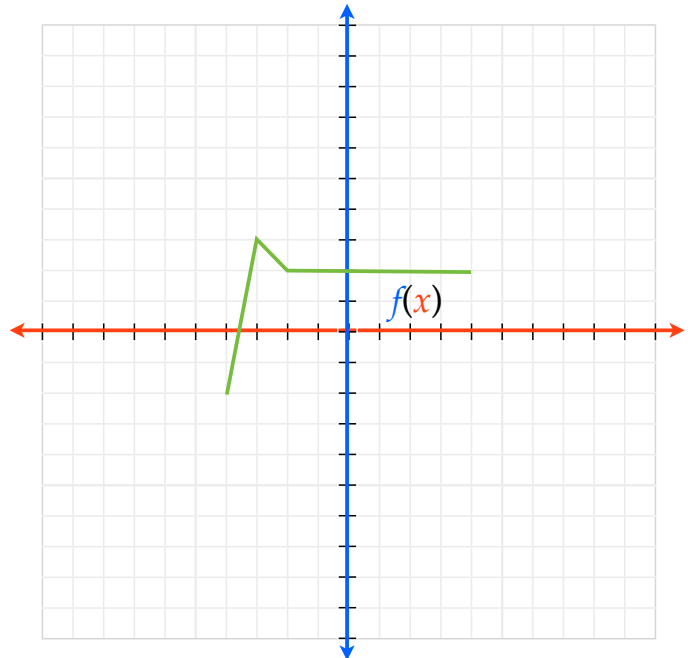
$$y = \sqrt{\frac{1}{3}x}$$

Graphing functions with stretching
and compressing

Given the parent function

$$y = f(x),$$

Graph: $y = 3f(x)$

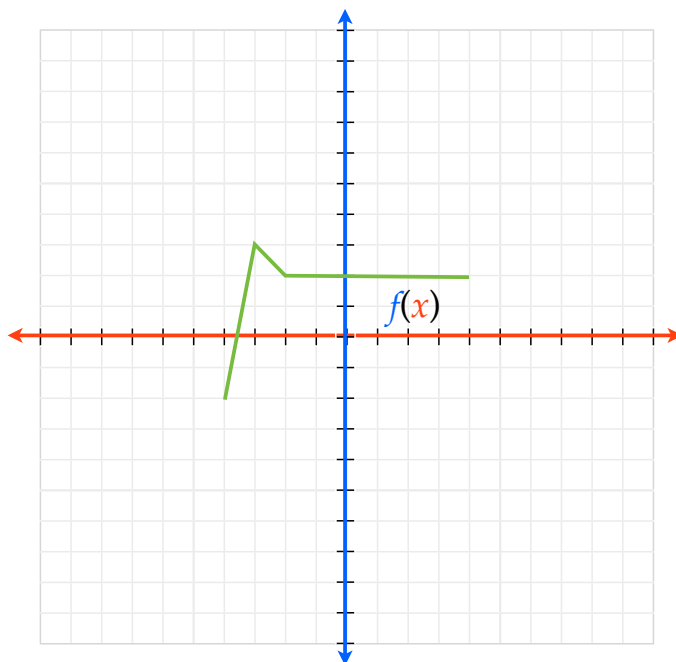


Graphing functions with stretching
and compressing

Given the **parent function**

$$y = f(x),$$

Graph: $y = f\left(\frac{1}{2}x\right)$

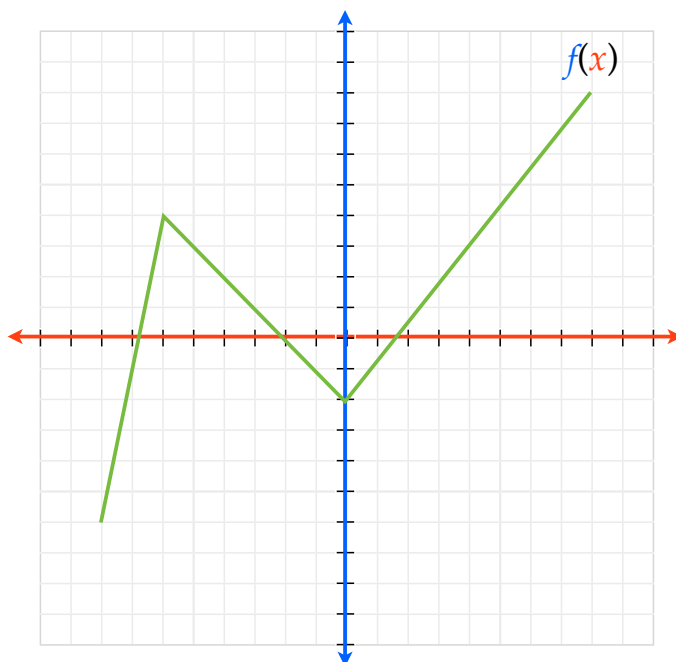


Graphing functions with stretching
and compressing

Given the **parent function**

$$y = f(x),$$

Graph: $y = \frac{1}{2}f(x)$

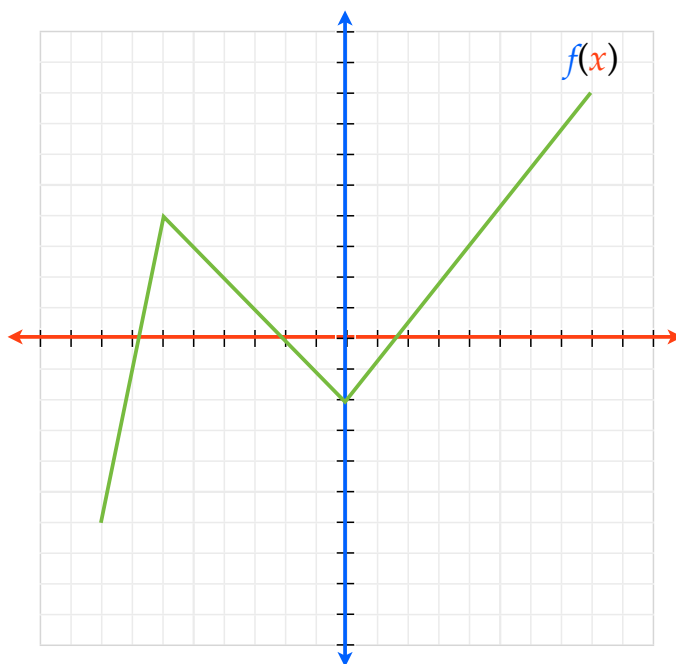


Graphing functions with stretching
and compressing

Given the parent function

$$y = f(x),$$

Graph: $y = f(2x)$

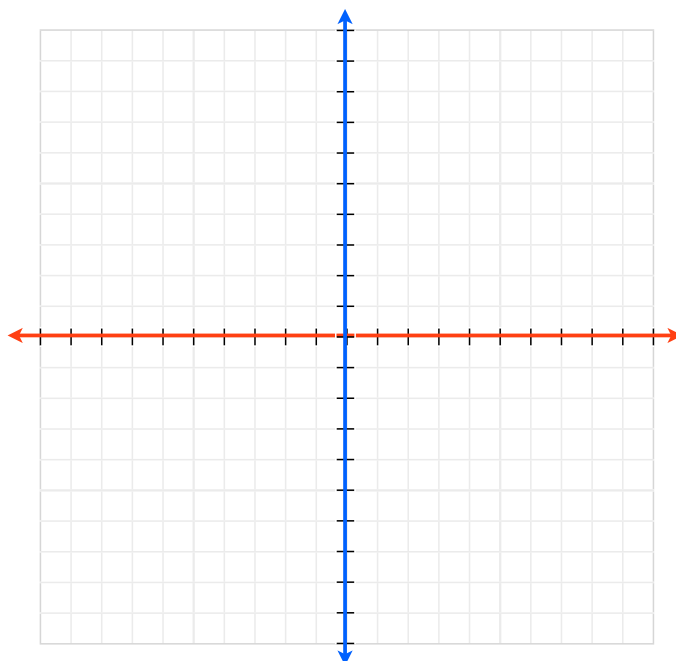


Graphing functions with stretching
and compressing

Given the quadratic parent function

$$y = x^2$$

Graph: $y = 2x^2$

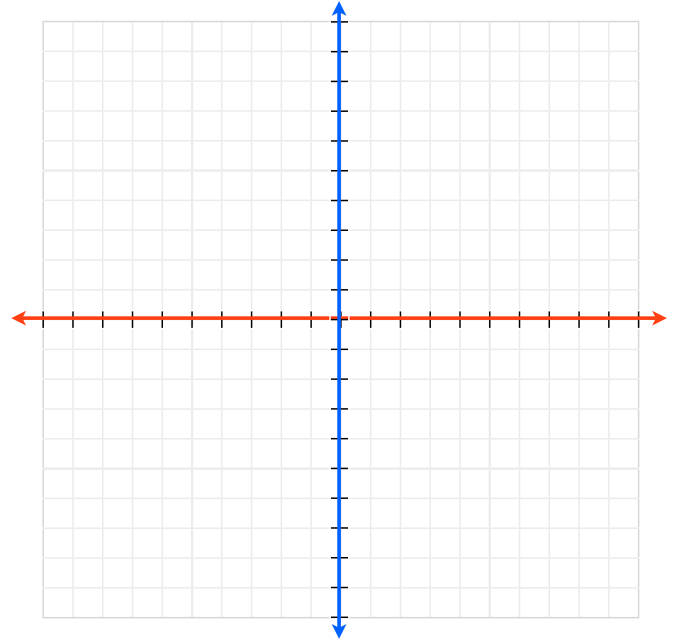


Graphing functions with stretching
and compressing

Given the **absolute value parent function**

$$y = |x|$$

Graph: $y = |3x|$



Given the **parent function**

$$y = f(x),$$

Vertical stretch or compression

$$y = a \cdot f(x)$$

if $|a| > 1$; stretch away from x -axis,
if $0 < |a| < 1$; compression toward x -axis

Horizontal stretch or compression

$$y = f\left(\frac{1}{b} \cdot x\right)$$

if $|b| > 1$; stretch away from y -axis,
if $0 < |b| < 1$; compression toward y -axis

a and b can cause a stretch or compression on $f(x)$