

Objectives

- Transform linear functions.
- Solve problems using linear transformations.

Example 1

a) Let $g(x)$ be the indicated transformation of $f(x)$. Write the rule for $g(x)$.
 $f(x) = 2x + 3$; vertical translation 4 units up.

b) Let $g(x)$ be the indicated transformation of $f(x)$. Write the rule for $g(x)$.
Linear function defined in the table; reflection across y-axis.

x	-1	0	1
$f(x)$	0	2	4

Try it!

a) Let $g(x)$ be the indicated transformation of $f(x)$. Write the rule for $g(x)$.
 $f(x) = 3x + 1$; translation 2 units right.

b) Let $g(x)$ be the indicated transformation of $f(x)$. Write the rule for $g(x)$.
Linear function defined in the table; reflection across x-axis.

x	-1	0	1
y	1	2	3

Example 2

Stretching and compressing linear functions.

- a) Let $g(x)$ be a horizontal compression of $f(x) = 2x - 1$ by the factor of $\frac{1}{3}$. Write the rule for $g(x)$, and graph the function.



Try it!

- Let $g(x)$ be a vertical compression of $f(x) = 3x + 2$ by the factor of $\frac{1}{4}$. Write the rule for $g(x)$,

Example 3

Let $g(x)$ be a vertical shift of $f(x) = x$ down 2 units followed by a vertical stretch by the factor of 5. Write the rule for $g(x)$,

Try it!

Let $g(x)$ be a vertical compression of $f(x) = x$ by the factor of $\frac{1}{2}$ followed by a horizontal shift 8 units to the left. Write the rule for $g(x)$.