

## Exercise 70

For the following exercises, describe how the formula is a transformation of a toolkit function. Then sketch a graph of the transformation.

$$g(x) = 5(x + 3)^2 - 2$$

### Solution

Start with the parent function.

$$x^2$$

Multiplying by 5 vertically stretches the function by a factor of 5.

$$5x^2$$

Replacing  $x$  with  $x + 3$  shifts it to the left by 3 units.

$$5(x + 3)^2$$

Subtracting 2 from the function shifts the graph down 2 units.

$$5(x + 3)^2 - 2$$

