

Exercise 69

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

$$g(x) = 4(x + 1)^2 - 5$$

Solution

Start with the parent function.

$$x^2$$

Multiplying by 4 vertically stretches the function by a factor of 4.

$$4x^2$$

Replacing x with $x + 1$ shifts it to the left by 1 unit.

$$4(x + 1)^2$$

Subtracting 5 from the function shifts the graph down 5 units.

$$4(x + 1)^2 - 5$$

