

## Exercise 71

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

$$h(x) = -2|x - 4| + 3$$

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### Solution

Start with the parent function.

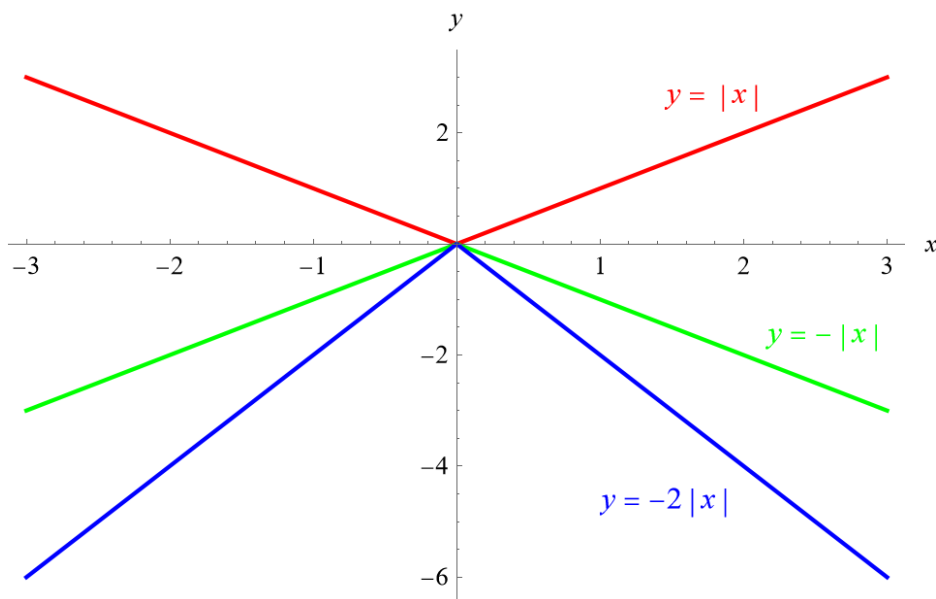
$$|x|$$

Multiplying by  $-1$  reflects the graph over the  $x$ -axis.

$$-|x|$$

Multiplying by 2 vertically stretches the function by a factor of 2.

$$-2|x|$$



Replacing  $x$  with  $x - 4$  shifts it to the right by 4 units.

$$-2|x - 4|$$

Adding 3 to the function shifts the graph up 3 units.

$$-2|x - 4| + 3$$

