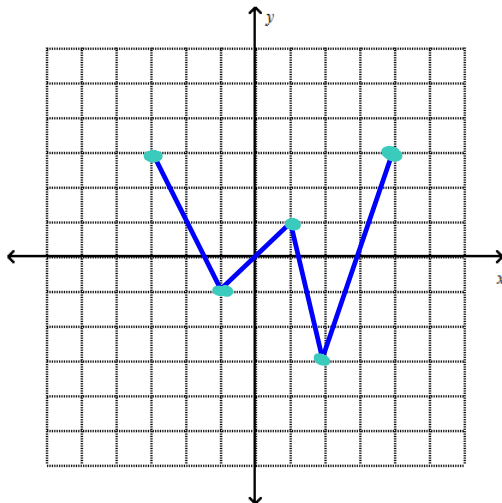


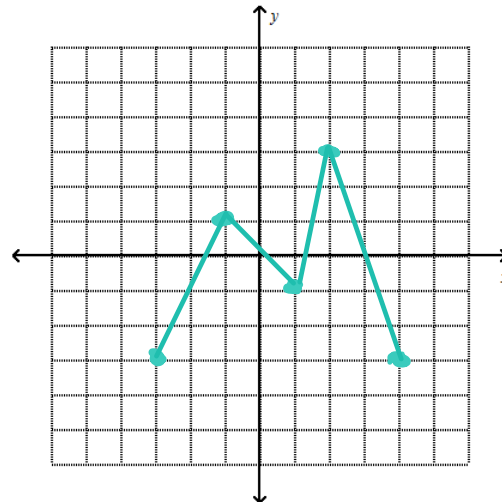
## 2.5 Transformations of Functions Part 2

The graph of  $f(x)$  is given. Sketch the graph of the given transformation.

$$y = f(x)$$

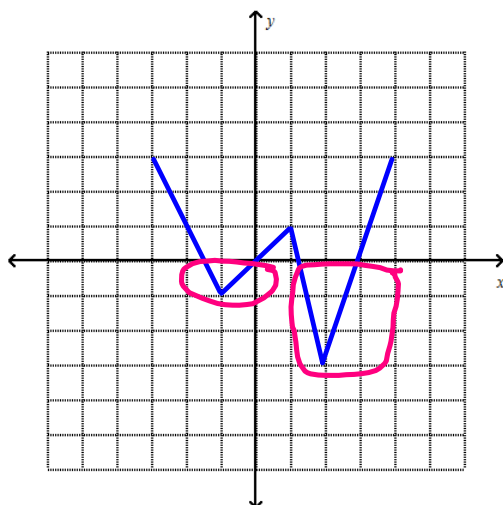


reflection over  
 $y = -f(x)$  x-axis

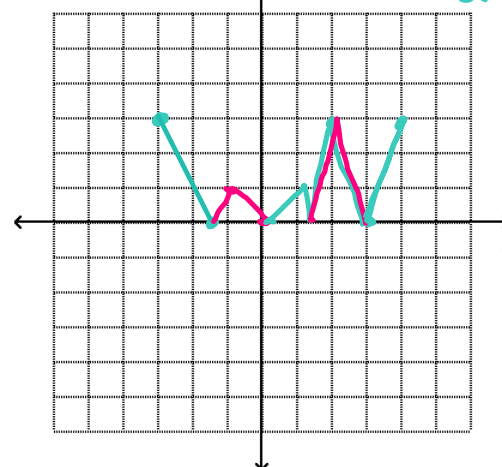


The graph of  $f(x)$  is given. Sketch the graph of the given transformation.

$$y = f(x)$$

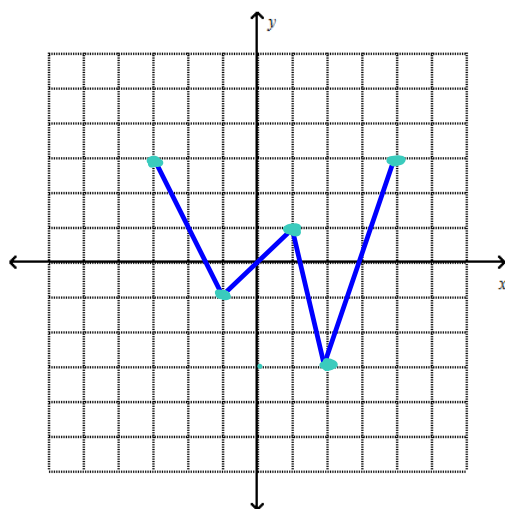


positive y-values  
 $y = |f(x)|$   
 abs. value

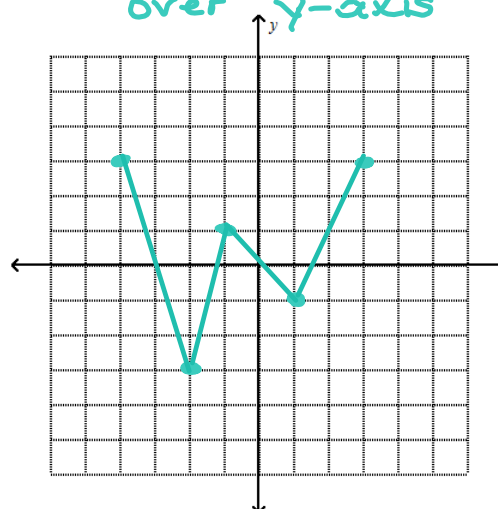


The graph of  $f(x)$  is given. Sketch the graph of the given transformation.

$$y = f(x)$$

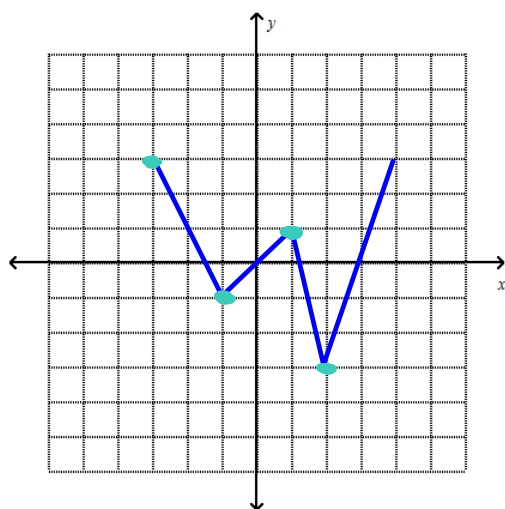


reflection  
 $y = f(-x)$   
 over  $y$ -axis

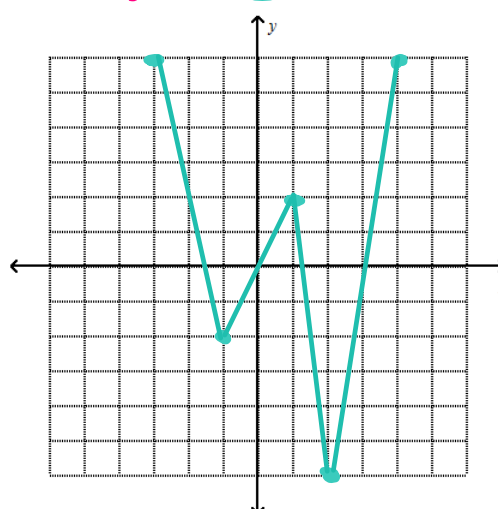


The graph of  $f(x)$  is given. Sketch the graph of the given transformation.

$$y = f(x)$$

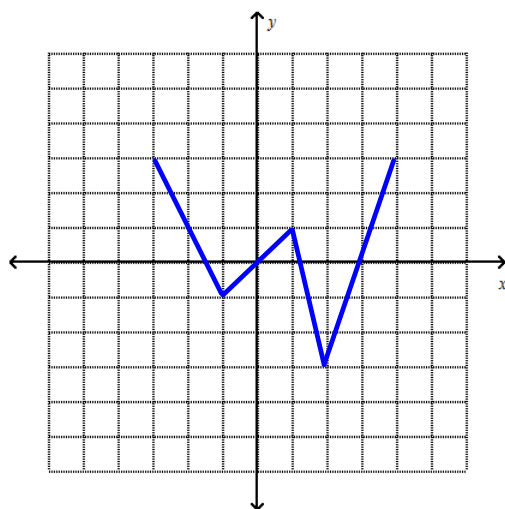


vert. stretch  
 $y = 2f(x)$

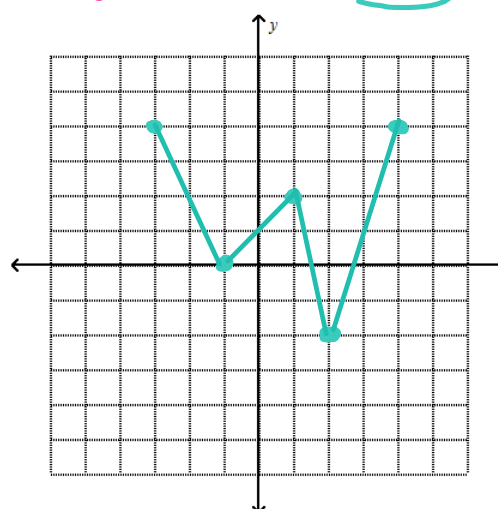


The graph of  $f(x)$  is given. Sketch the graph of the given transformation.

$$y = f(x)$$

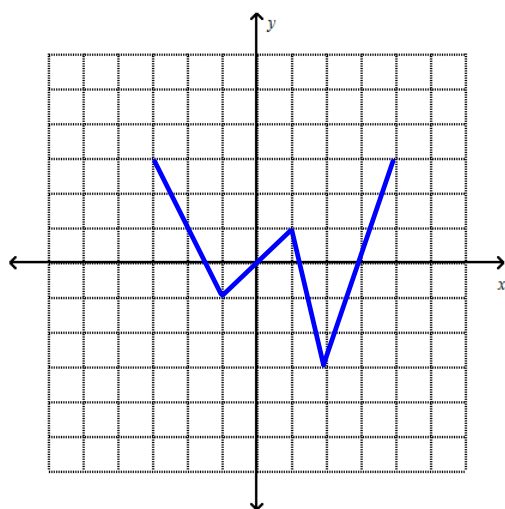


$$y = f(x) + 1$$

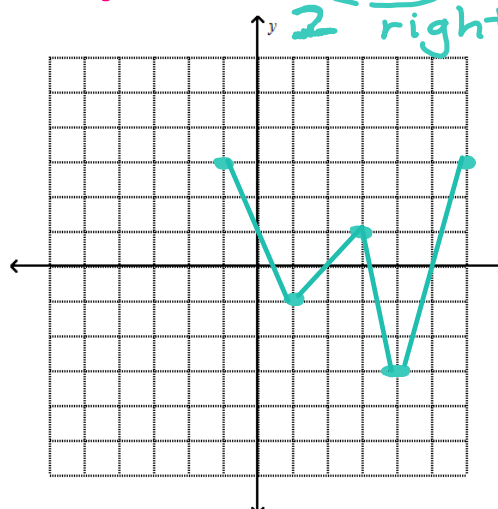


The graph of  $f(x)$  is given. Sketch the graph of the given transformation.

$$y = f(x)$$

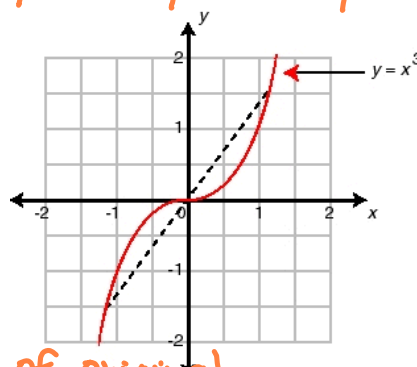
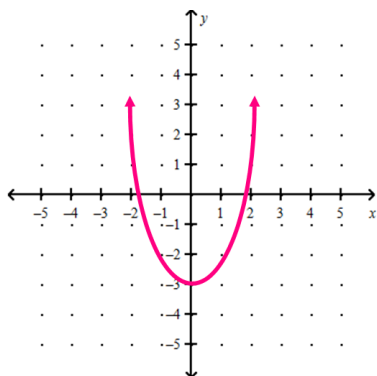


$$y = f(x - 2)$$



## Even and Odd Functions

If  $f(-x) = f(x)$ ,  
then  $f$  is called an **even function**.  
*symmetry over y-axis*



*opp. of original*

If  $f(-x) = -f(x)$ ,  
then  $f$  is called an **odd function**.  
*symmetry about the origin*

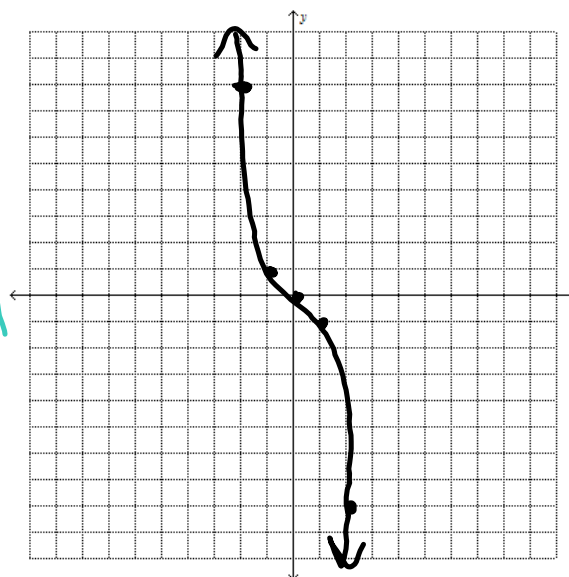
Determine whether the function is even, odd, or neither. If  $f$  is even or odd, use symmetry to sketch its graph.

$$\begin{aligned}
 f(x) &= -x^3 \\
 f(-x) &= -(-x)^3 \\
 &= -(-x^3) \\
 &= x^3 \\
 &= -(-x^3)
 \end{aligned}$$

*opp. of original*

**ODD FUNCTION**

x	y
0	$-0^3 = 0$
1	$-1^3 = -1$
2	$-2^3 = -8$



Determine whether the function is even, odd, or neither. If  $f$  is even or odd, use symmetry to sketch its graph.

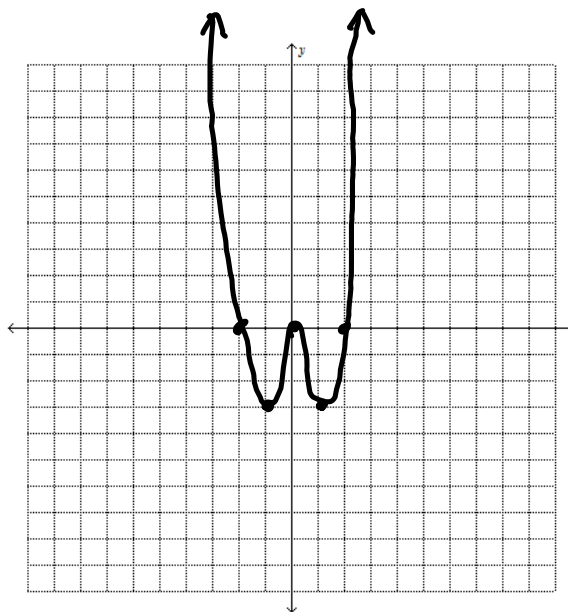
$$f(x) = x^4 - 4x^2$$

$$f(-x) = (-x)^4 - 4(-x)^2$$

$$= x^4 - 4x^2$$

EVEN FUNCTION  
sym.  $\rightarrow$  y-axis

x	y
0	0
1	-3
2	0
3	45



Determine whether the function is even, odd, or neither. If  $f$  is even or odd, use symmetry to sketch its graph.

$$f(x) = 3x^3 + 2x^2 + 1$$

$$f(-x) = 3(-x)^3 + 2(-x)^2 + 1$$

$$= -3x^3 + 2x^2 + 1$$

NEITHER

