





# Graphing Absolute Value Functions

2-3

## Warm Up

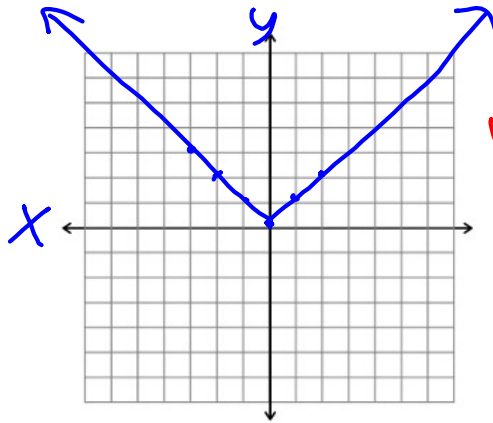
*Evaluate*

- $|-3| =$    $= 3$        $|2| = 2$
- $|-2 + 5| =$
- $|-4 - 2| =$   
- $|-1 + 6| =$  
- $|14 - 18| =$
- $|1 - 2| =$

## Graphing Absolute Value Task

$$y = |x|$$

$$y = |x|$$



Vertex:  
(0,0)

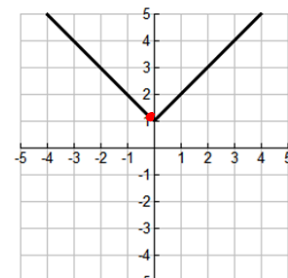
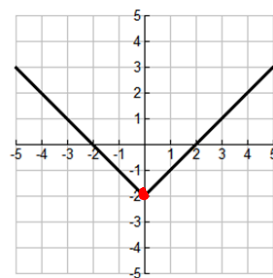
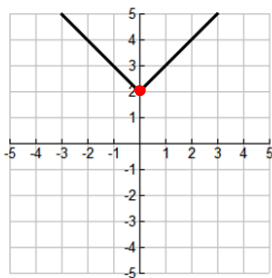
Slope: 1

x	y
-3	3
-2	2
-1	1
0	0
1	1
2	2

$$f(x) = |x| + \underline{2}$$

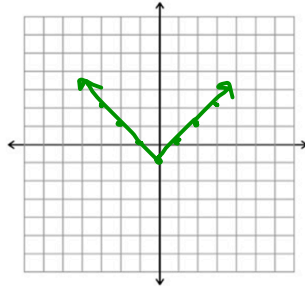
$$f(x) = |x| - \underline{2}$$

$$f(x) = |x| + \underline{1}$$



Discuss with a partner any patterns you may see. Predict what the graph will look like for the following function. Sketch your prediction below.

$$f(x) = |x| - 1$$



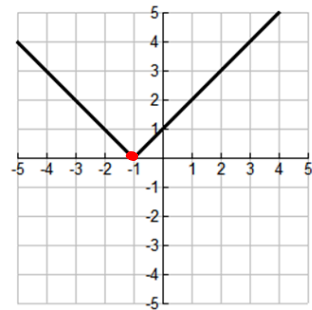
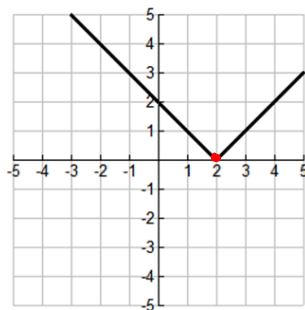
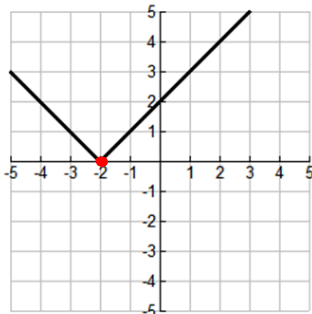
Use your graphing calculator to check your prediction.

$$f(x) = |x + \underline{2}|$$

$$f(x) = |x - \underline{2}|$$

$$f(x) = |x + \underline{1}|$$

opposite Right  $\rightarrow$  Left

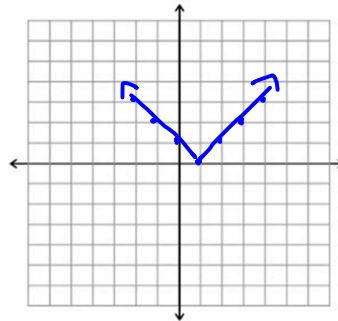


Discuss with a partner any patterns you may have noticed from the examples above. Predict what the graph will look like for the following function. Sketch your prediction on the given graph below.

$$f(x) = |x - 1|$$

Complete the table and use it to graph the solution and check your answer.

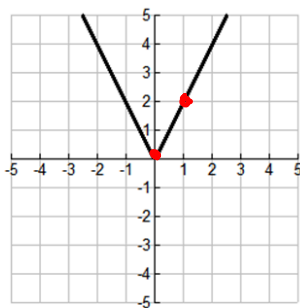
x	f(x)
-2	
-1	
0	
1	
2	



Slope

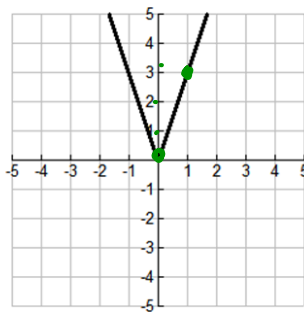
$$f(x) = |2x|$$

$$\frac{2}{1} = 2$$



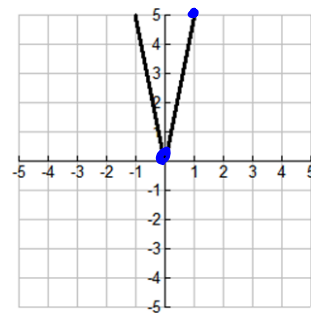
$$f(x) = 3|x|$$

$$\frac{3}{1} = 3$$



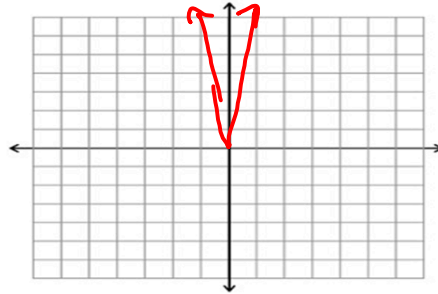
$$f(x) = |5x|$$

$$\frac{5}{1} = 5$$



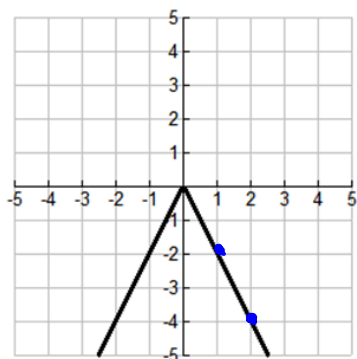
Discuss with a partner any patterns you may have noticed from the examples above. Predict what the graph will look like for the following function. Sketch your prediction on the given graph below.

$$f(x) = 7|x|$$

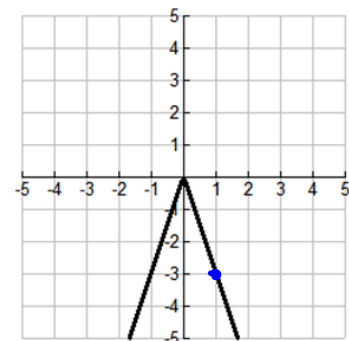


Use a graphing calculator to check your solution

$$f(x) = 2|x|$$

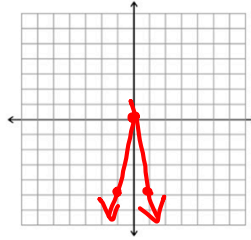


$$f(x) = 3|x|$$



Discuss with a partner any patterns you may have noticed from the examples above. Predict what the graph will look like for the following function.

$$f(x) = -5|x|$$



Complete the table and use it to graph the solution and check your answer.

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

Use the information you have gathered from all of the examples and predict and sketch the following function. Check your answer with your calculator.

$$f(x) = |x + 5| - 2$$



**Always check:**

- Open up or down (pos or neg in front)
- Steepness (slope - in front of abs value)
- Left or right (opposite of inside abs value)
- Up or down (outside of abs value)

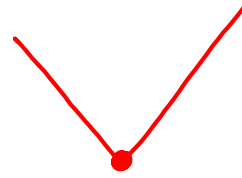
$$f(x) = \pm a |x \pm b| \pm c$$

opens up or down      slope      right or left      up or down

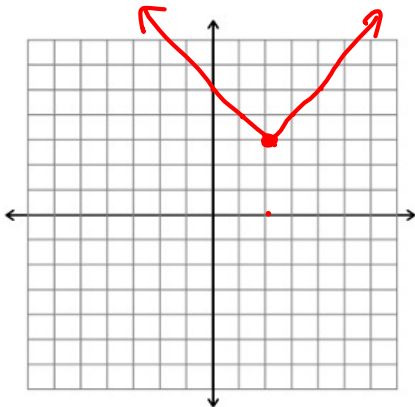
$$f(x) = \pm a |x \pm b| \pm c$$

$$1. f(x) = |x - 3| + 2$$

↳  
y-value



1.



$$f(x) = |x - 2| + 3$$

↓  
y