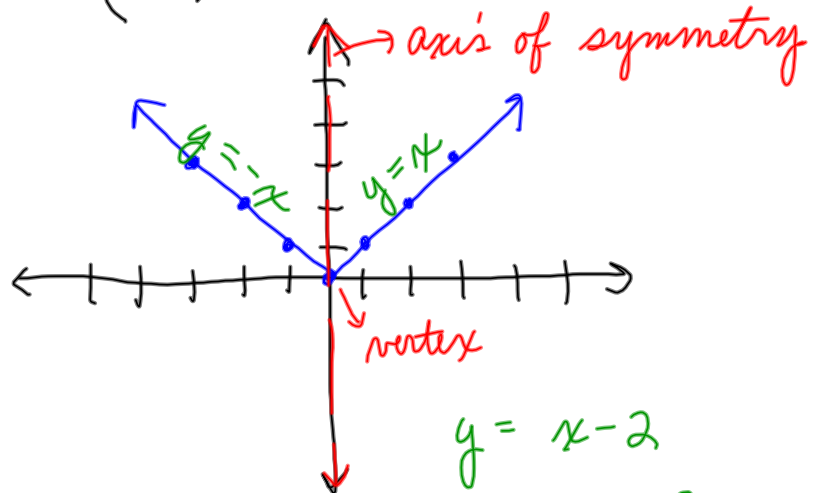


# Sec. 2.7 Absolute Value Functions and Graphs

Parent Function:  $f(x) = |x|$   
 $y = |x|$

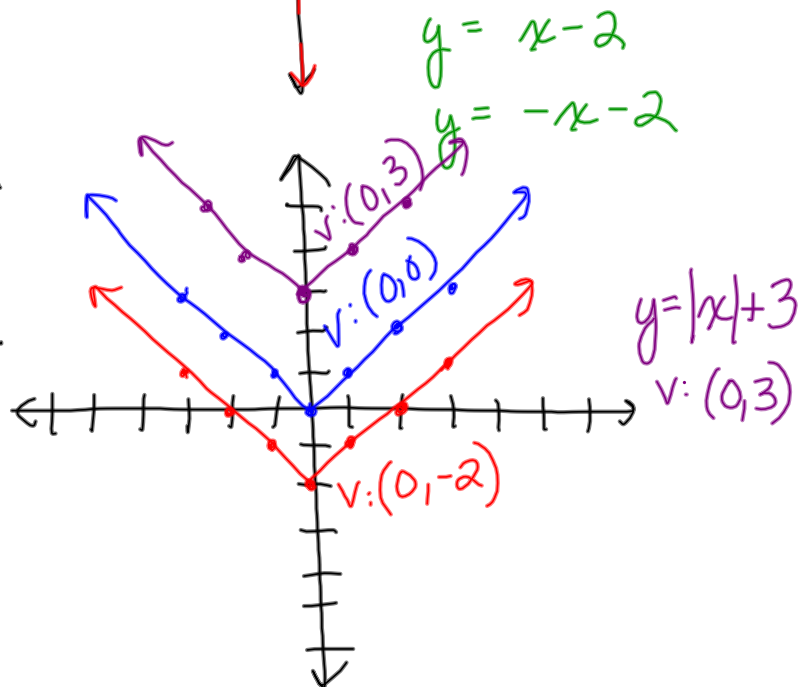
x	y
-3	3
-2	2
-1	1
0	0
1	1
2	2
3	3

$$f(x) = \begin{cases} x & \text{when } x \geq 0 \\ -x & \text{when } x < 0 \end{cases}$$



$$y = |x| - 2$$

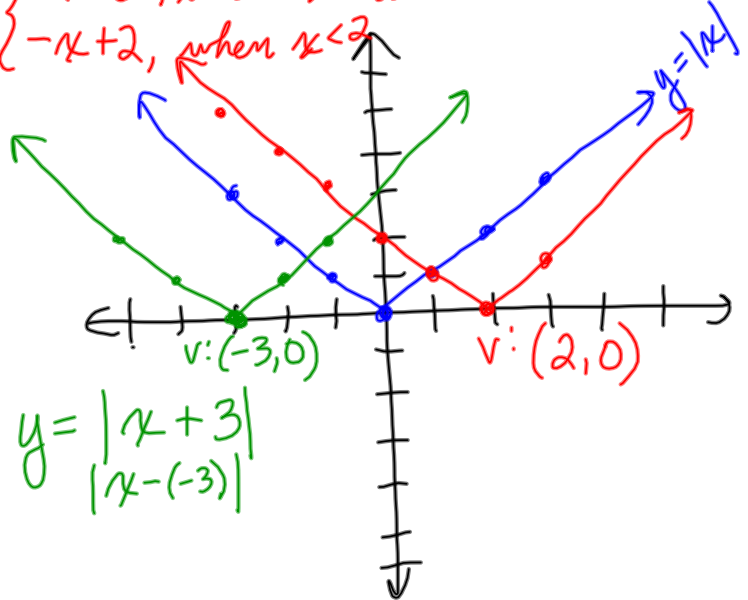
x	Parent  x	y =  x  - 2
-3	3	1
-2	2	0
-1	1	-1
0	0	-2
1	1	-1
2	2	0
3	3	1



\*  $y = |x| + k$  Translates (shifts) graph  $k$  units up/down.

$$y = |x - 2| \quad y = \begin{cases} x - 2, & \text{when } x \geq 2 \\ -x + 2, & \text{when } x < 2 \end{cases}$$

$x$	$ x - 2  = y$
-3	$ -3 - 2  = 5$
-2	$ -2 - 2  = 4$
-1	$ -1 - 2  = 3$
0	$ 0 - 2  = 2$
1	$ 1 - 2  = 1$
2	$ 2 - 2  = 0$
3	$ 3 - 2  = 1$



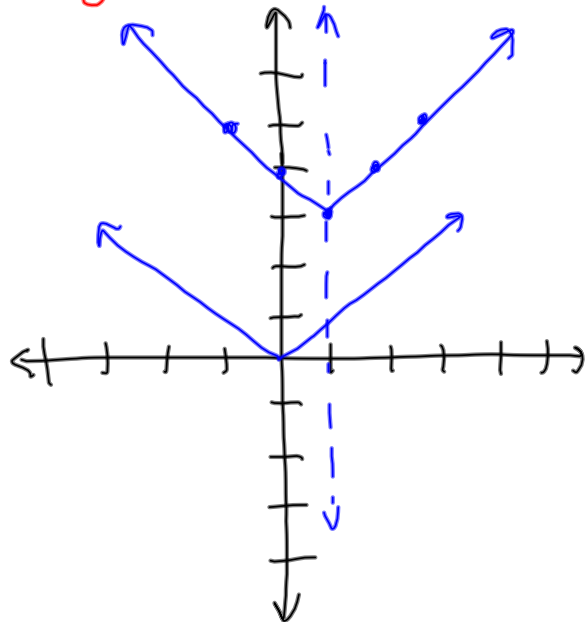
\*  $y = |x - h|$  Translates (shifts) graph  $h$  units left/right.

$$y = |x - 1| + 3$$

right 1 up 3

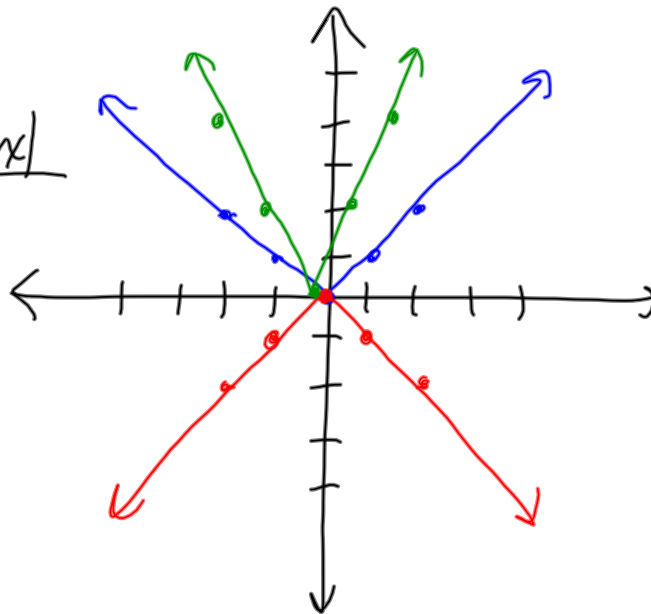
$v: (1, 3)$

"m": 1, -1



$$y = -|x|$$

$y$	$ x $	$- x $	$2 x $
3	3	-3	6
2	2	-2	4
1	1	-1	2
0	0	0	0
-1	1	-1	2
-2	2	-2	4
-3	3	-3	6



\*  $y = -|x|$  Reflect graph over the x-axis (flip)

$y = \frac{a}{2}|x|$  Stretch graph by a.