

Do Now

Evaluate the expression for $x = -6$

1. $|x|$

2. $-|x - 3|$

3. $|1 - x| + 4$

4. $2|x - 1.5| + .5$

5. $-3|x + 4| - 1$

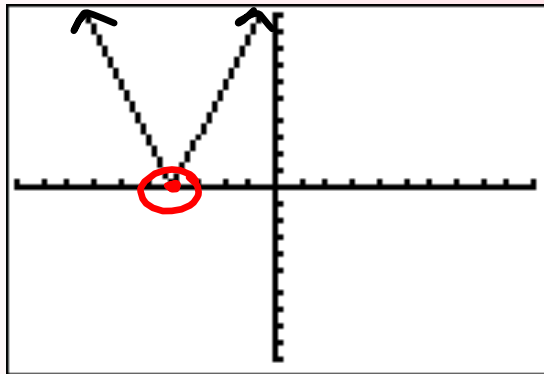
Algebra 2

Ch. 2 Handout 2.5

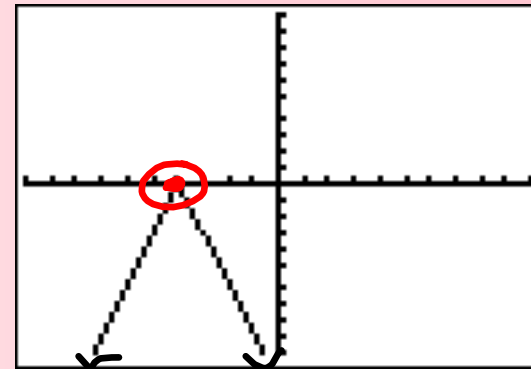
Absolute Value Functions and Graphs

An absolute value function is a function of the form $f(x) = |mx + b| + c$ where $m \neq 0$.

$$y = |3x + 12|$$

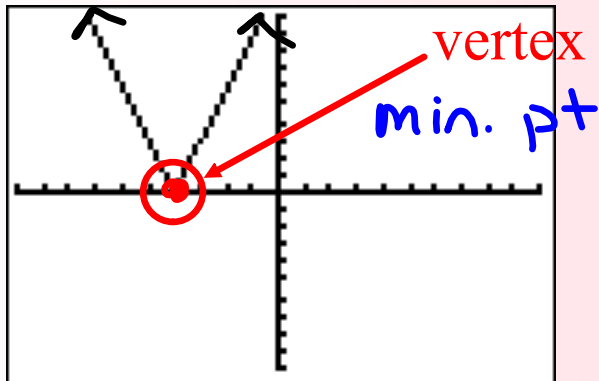


$$y = -|3x + 12|$$

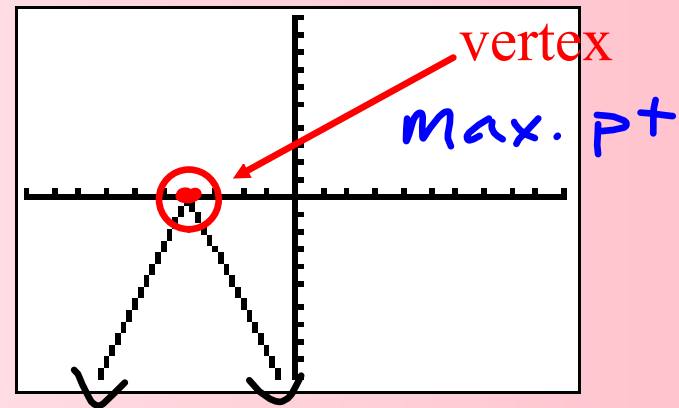


The vertex of a function is a point where the function reaches a maximum or minimum.

$$y = |3x + 12|$$



$$y = -|3x + 12|$$



Finding the x-coordinate of vertex: *Must be solve for y*

start with absolute value equation

$$y = |mx + b| + c$$

take expression inside | | and set equal to 0

$$mx + b = 0$$

solve equation for x

$$x = -\frac{b}{m}$$

Finding the y-coordinate of vertex:

solve the absolute value equation for y

$$y = |mx + b| + c$$

y-coordinate

$$\text{Vertex} = \left(-\frac{b}{m}, c \right)$$

Graph the equation by using a table of values. Evaluate the equation for several values of x . Make a table of values.

$$y = |2x - 1| + 0$$

$V: (\frac{1}{2}, 0)$

Roots: 1

Find Vertex

$$2x - 1 = 0$$

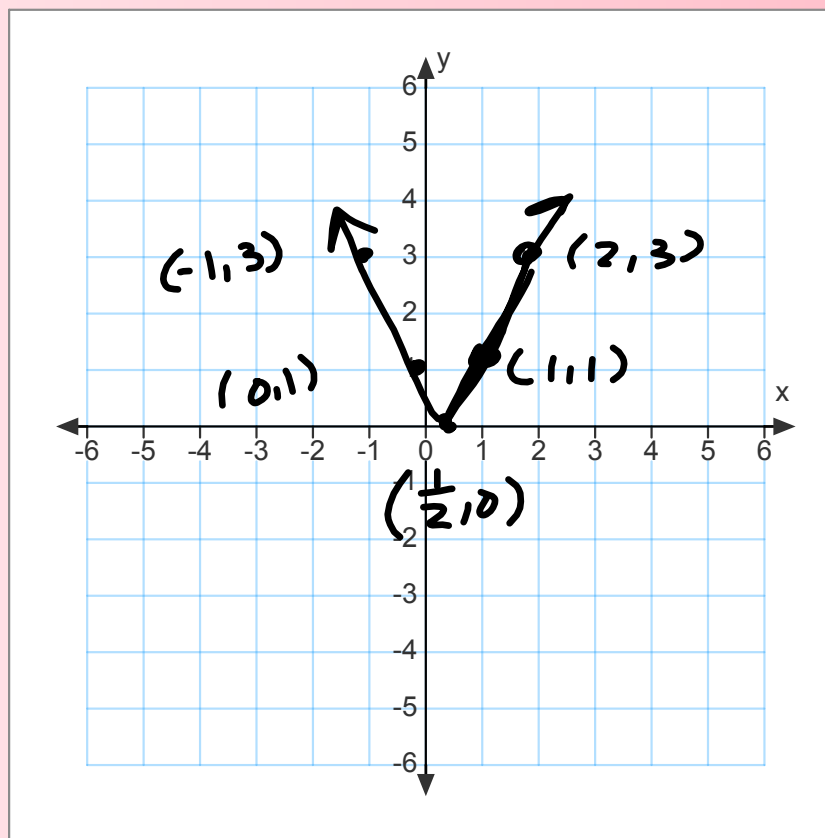
$$2x = 1$$

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

$y = 0$

Make table

x	$y = 2x - 1 $	y
-1	$= 2(-1) - 1 $	3
0	$= 2(0) - 1 $	1
$\frac{1}{2}$	$\sim \sim \sim \sim \sim$	0
1	$= 2(1) - 1 $	1
2	$= 2(2) - 1 $	3



$$y = |2x - 5| + 0$$

V: $(\frac{5}{2}, 0)$

Roots: 1

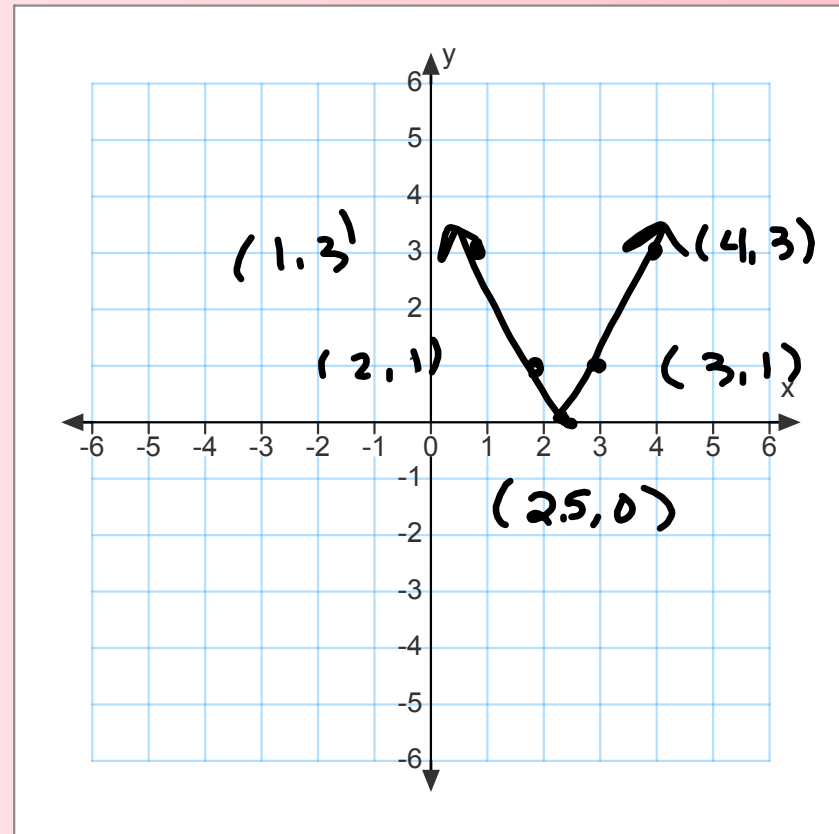
$$2x - 5 = 0$$

$$2x = 5$$

$$x = \frac{5}{2}$$

$$y = 0$$

x	y = 2x - 5	y
1	= 2(1) - 5	3
2	= 2(2) - 5	1
2.5	<u> </u>	0
3	= 2(3) - 5	1
4	= 2(4) - 5	3



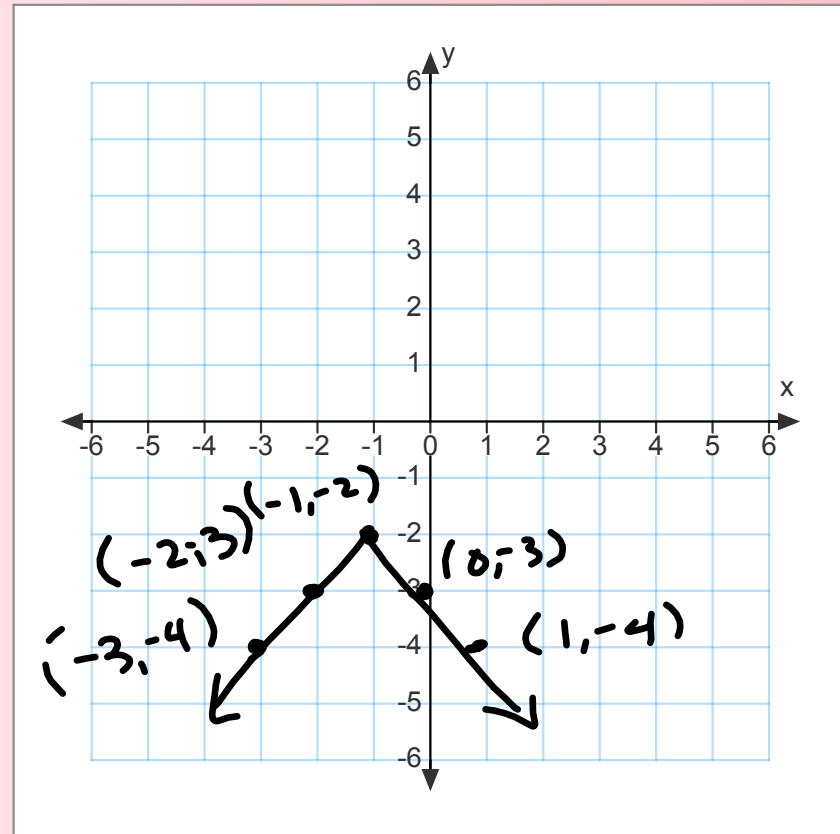
$$y = -|x+1| - 2$$

$V : (-1, -2)$

Roots: None

$x+1=0 \quad y=-2$
 $x=-1$

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



$$V: \underline{(0, 5)}$$

$$-x = 0$$

x	= - -x + 5	y
-2	= - -(-2) + 5	3
-1	= - -(-1) + 5	4
0	~~~~~	5
1	= - -1 + 5	4
2	= - -2 + 5	3



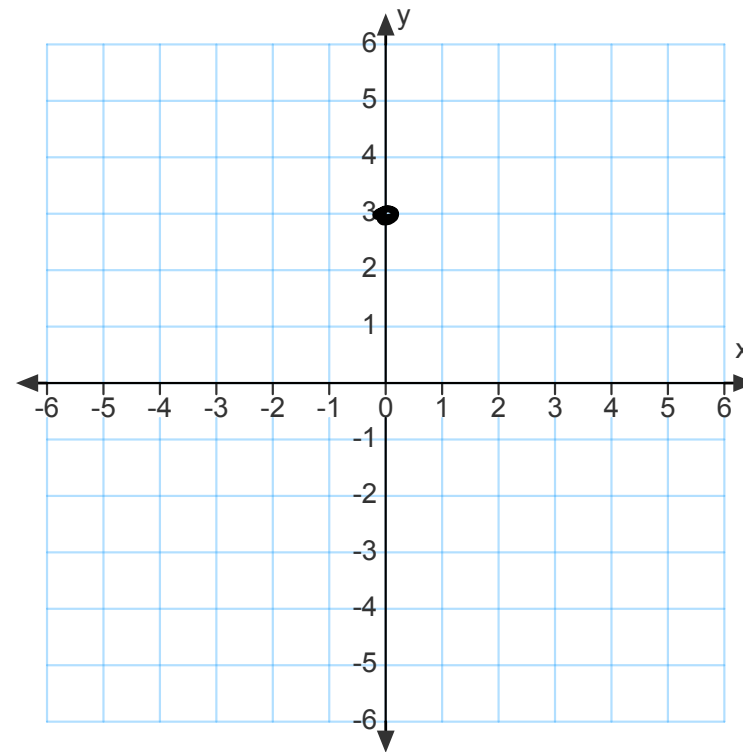
$$y = 3 - \left| \frac{x}{2} \right|$$
$$y = - \left| \frac{x}{2} \right| + 3$$

$V: (0, 3)$

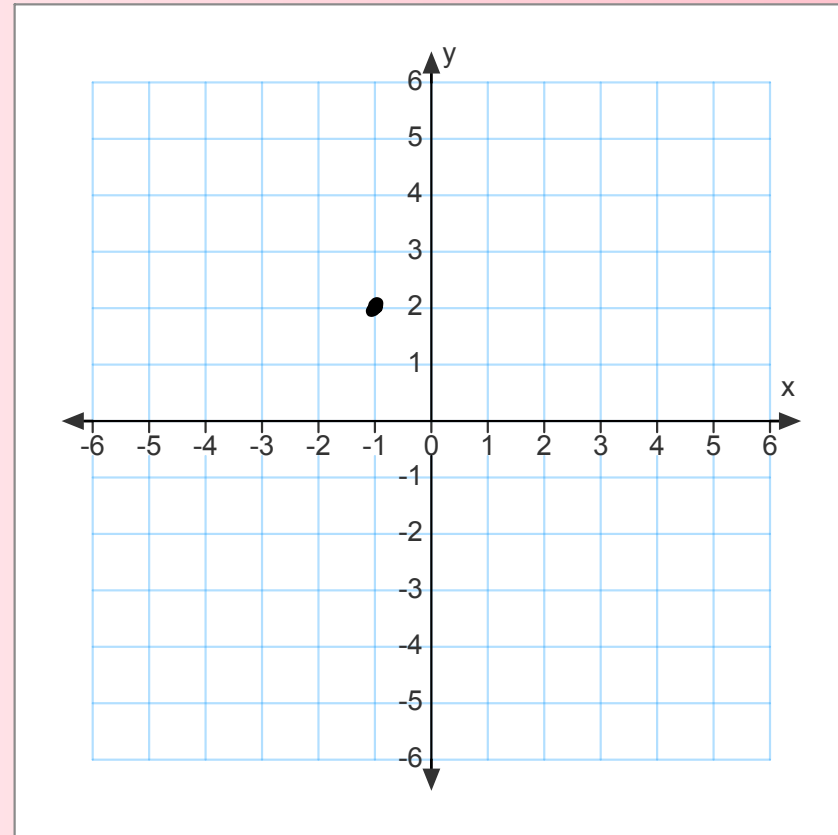
Roots: 2

? $\frac{x}{2} = 0.2$

$x = 0 \quad y = 3$



$$y = 2 - |x + 1|$$
$$y = -|x + 1| + 2$$
$$V: (-1, 2)$$
$$R + s: 2$$
$$x + 1 = 0$$
$$x = -1 \quad y = 2$$



$$V: \underline{\left(-\frac{8}{3}, -3\right)}$$

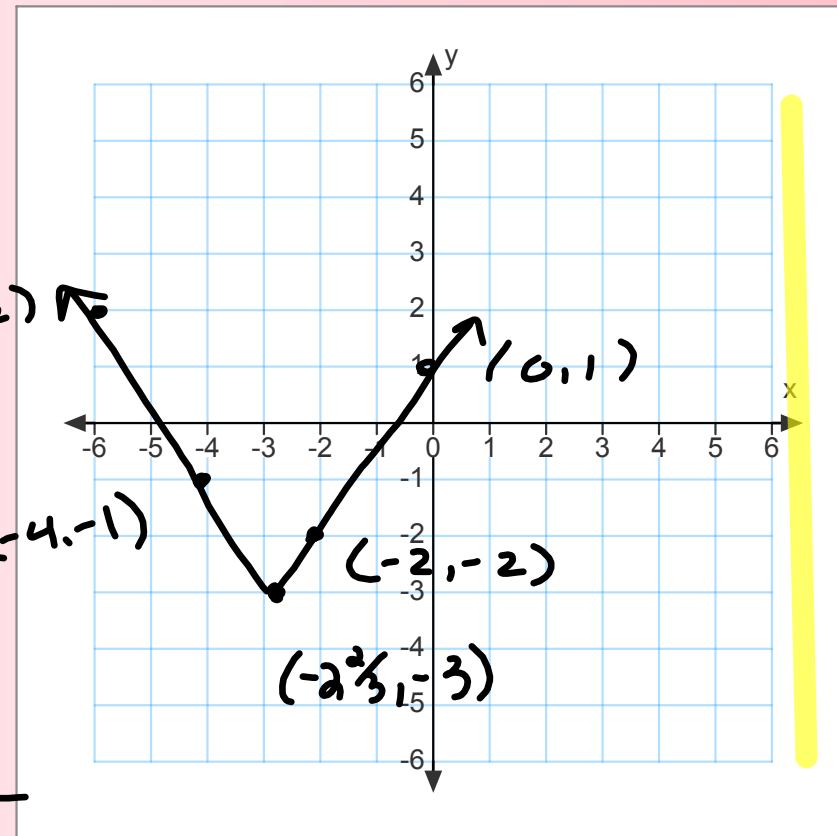
Rts: _____

$$\frac{3}{1}x + 4 = 0$$

$$\frac{2}{3} \cdot \frac{3}{2} x = -4 \cdot \frac{2}{3}$$

$$x = -\frac{8}{3} \quad y = -3$$

x	y = $\left \frac{3}{2}x + 4 \right - 3$	y
-6	$= \left \frac{3}{2}(-6) + 4 \right - 3$	2
-4	$= \left \frac{3}{2}(-4) + 4 \right - 3$	-1
$-2\frac{2}{3}$		-3
-2	$= \left \frac{3}{2}(-2) + 4 \right - 3$	-2
0	$= \left \frac{3}{2}(0) + 4 \right - 3$	1



Assignment

Day 1: Pgs 90-92 1-9 odds, 33,35,37
39,41,43,47

