

ABSOLUTE VALUE FUNCTIONS

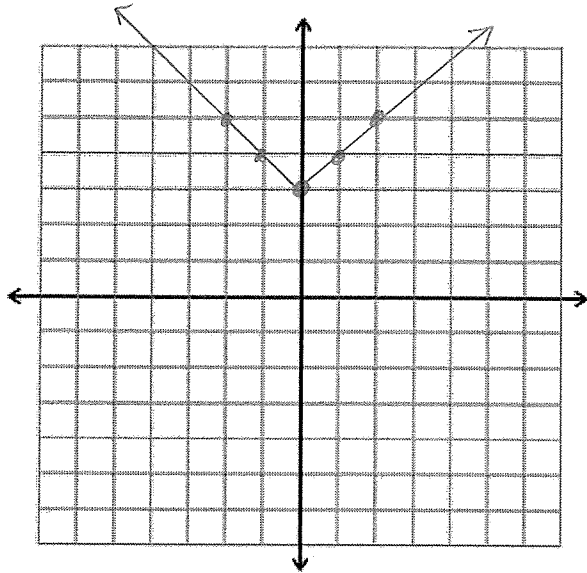
Graph each equation. Label the coordinates of the vertex and one more point.

1. $y = |x| + 3$

Slope of right arm = +1

Vertex = (0, 3)

Face up/down ? up

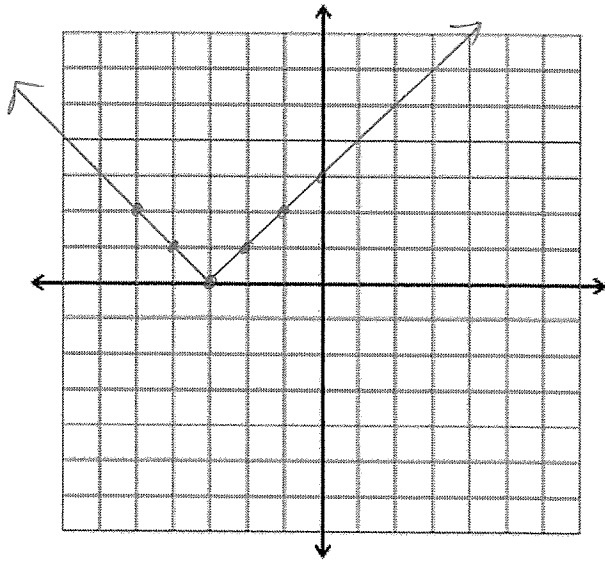


2. $y = |x + 3|$

Slope of right arm = +1

Vertex = (-3, 0)

Face up/down ? up

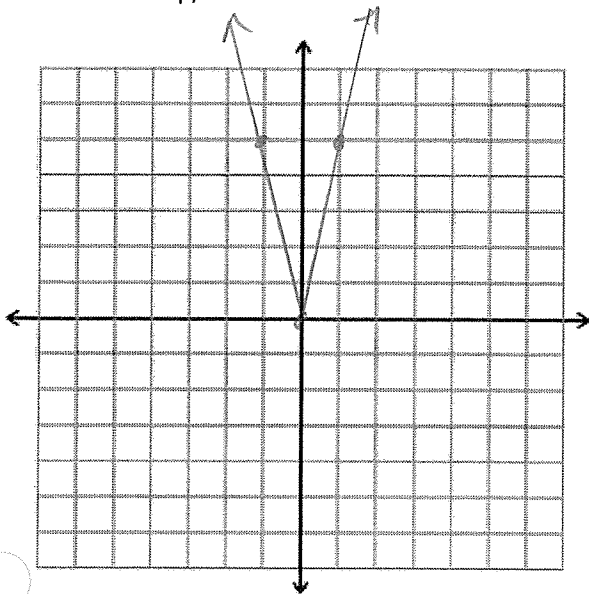


3. $y = 5|x|$

Slope of right arm = +5

Vertex = (0, 0)

Face up/down ?

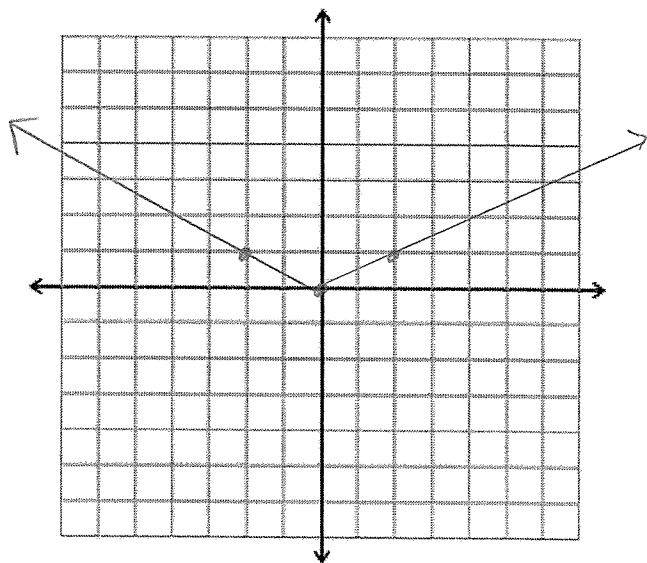


4. $y = \frac{1}{2}|x|$

Slope of right arm = +1/2

Vertex = (0, 0)

Face up/down ?

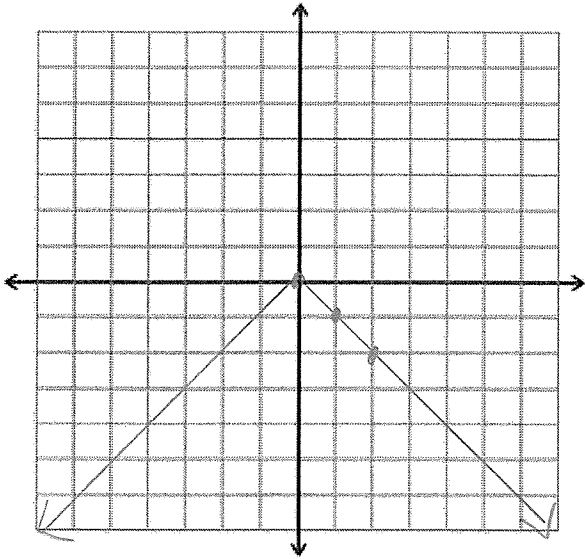


5. $y = -|x|$

Slope of right arm = -1

Vertex = (0,0)

Face up/down ? DOWN

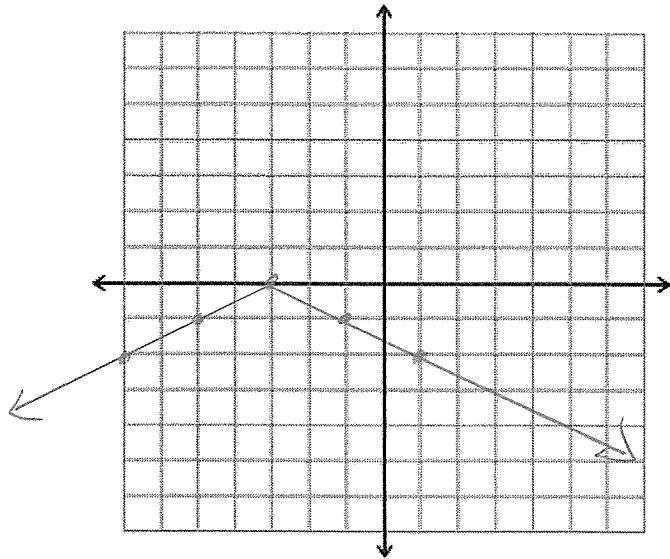


6. $y = -\frac{1}{2}|x+3|$

Slope of right arm = $-\frac{1}{2}$

Vertex = (-3,0)

Face up/down ? DOWN



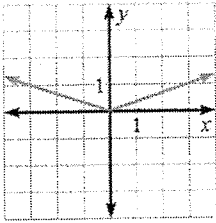
Advanced Algebra 2 Honors – Write Equations of Absolute Value Functions

Now you will apply the concepts you discovered to writing equations of graphs.

(If you need some guidelines: 1) find the slope of the right arm; 2) find the vertex; 3) think about where the slope and vertex go in the equation.)

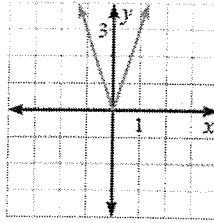
$$y = a|x-h| + k$$

1.



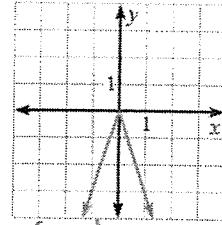
vertex $(0, 0)$
slope = $\frac{1}{3}$ $y = \frac{1}{3}|x|$

2.



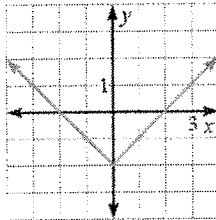
vertex $(0, 0)$
slope = 3
 $y = 3|x|$

3.



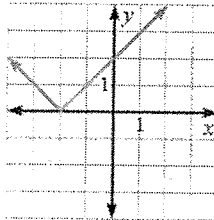
vertex $(0, 0)$
slope = -3
 $y = -3|x|$

4.



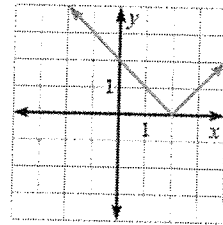
vertex $(0, -2)$
slope = 1
 $y = |x| - 2$

5.



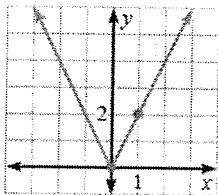
vertex $(-2, 0)$
slope = 1
 $y = |x + 2|$

6.



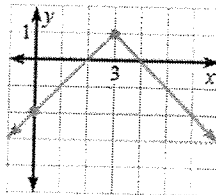
vertex $(2, 0)$
slope = 1
 $y = |x - 2|$

7.



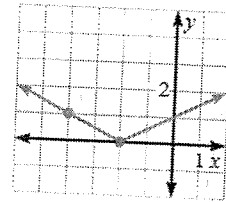
vertex $(0, 0)$ slope = 2
 $y = 2|x|$

8.



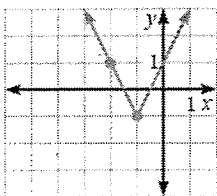
vertex $(3, 1)$ slope = -1
 $y = -|x - 3| + 1$

9.



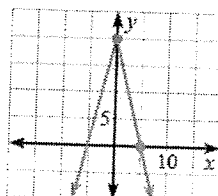
vertex $(-2, 0)$ slope = $\frac{1}{2}$
 $y = \frac{1}{2}|x + 2|$

10.



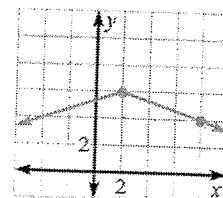
vertex $(-1, -1)$
slope = 2
 $y = 2|x + 1| - 1$

11.



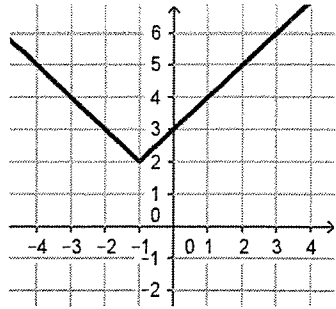
vertex $(0, 20)$
slope = -4
 $y = -4|x| + 20$

12.



vertex $(2, 6)$
slope = $-\frac{2}{6} = -\frac{1}{3}$
 $y = -\frac{1}{3}|x - 2| + 6$

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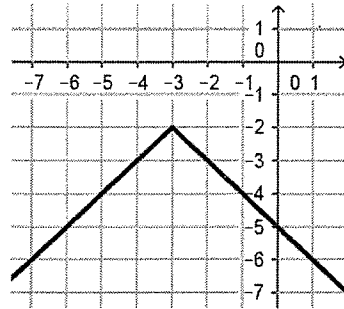
Equation:

vertex $(-1, 2)$

Slope = 1

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

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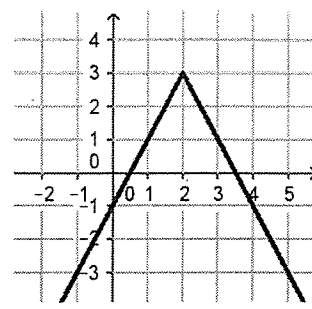
Equation:

vertex $(-3, -2)$

Slope = -1

$$y = -|x + 3| - 2$$

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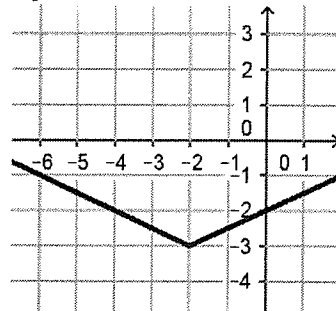
Equation:

vertex $(2, 3)$

Slope = -2

$$y = -2|x - 2| + 3$$

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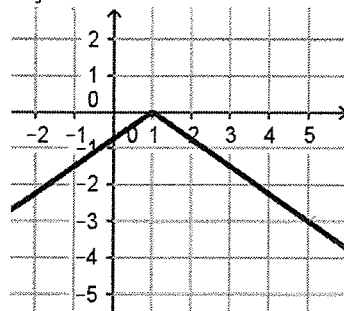


Equation:

vertex $(-2, -3)$ Slope = $\frac{1}{2}$

$$y = \frac{1}{2}|x + 2| - 3$$

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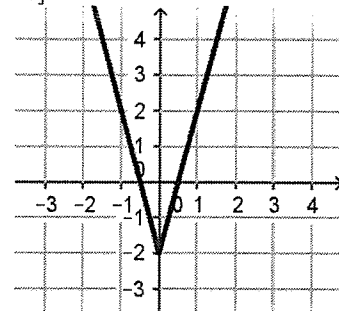


Equation:

vertex $(1, 0)$ Slope = $-\frac{3}{5}$

$$y = -\frac{3}{5}|x - 1|$$

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Equation:

vertex $(0, -2)$

Slope = 4

$$y = 4|x| - 2$$