ABSOLUTE VALUE FUNCTIONS

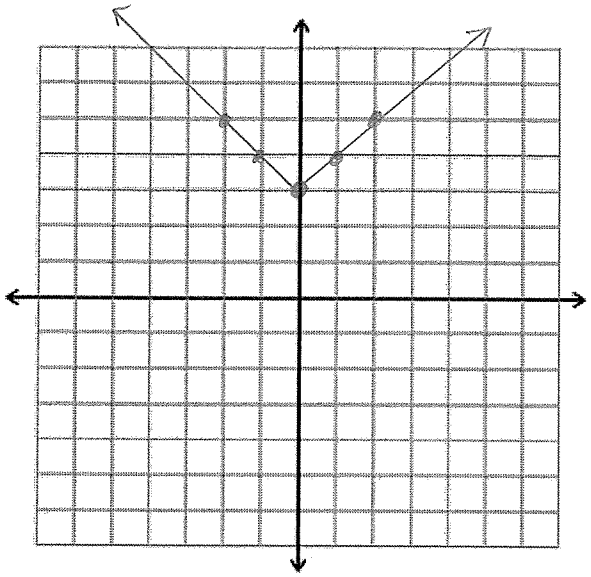
Graph each equation. Label the coordinates of the vertex and one more point.

1. $y = |x| + 3$

Slope of right arm = +1

Vertex = (0,3)

Face up/down ? up

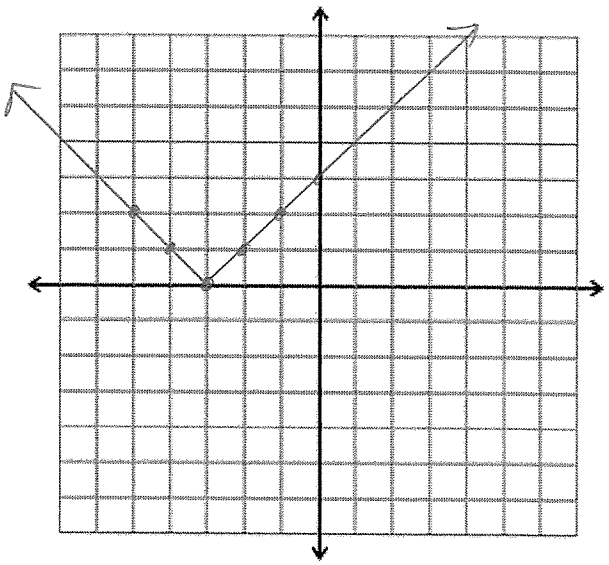


2. $y = |x + 3|$

Slope of right arm = +1

Vertex = (-3,0)

Face up/down ? up

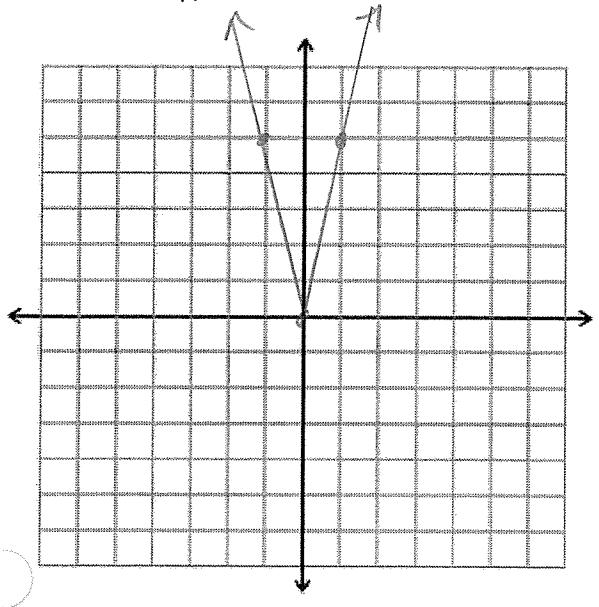


3. $y = 5\,|x|$

Slope of right arm = +5

Vertex = (0,0)

Face up/down ?

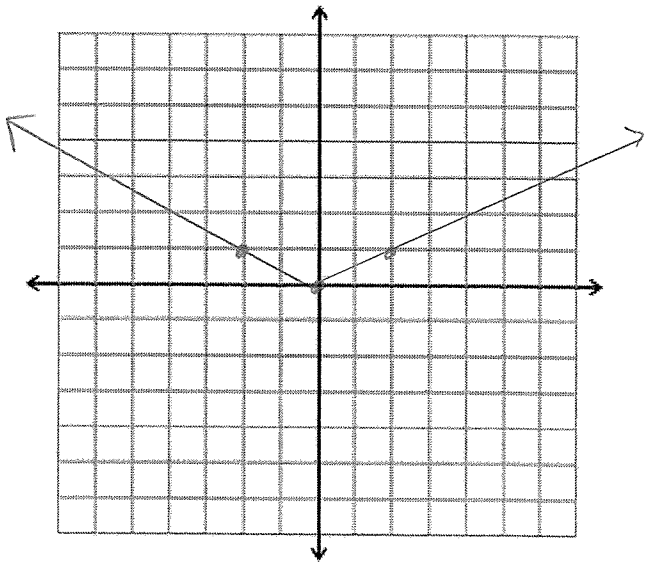


4. $y = \frac{1}{2}\,|x|$

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

Vertex = (0,0)

Face up/down ?

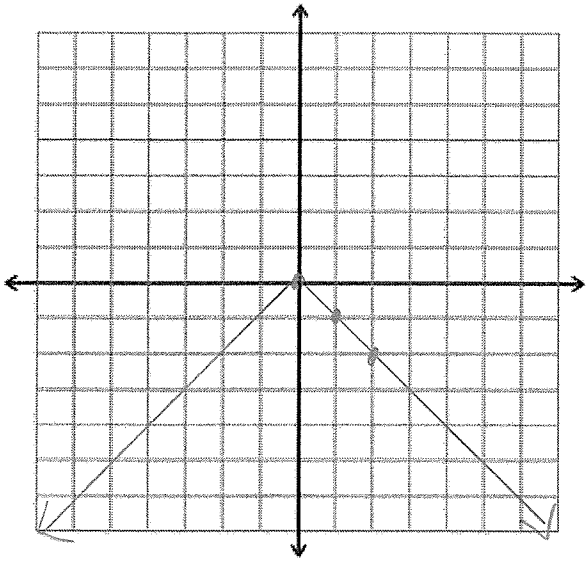


5. $y = -|x|$

Slope of right arm = -1

Vertex = $(0,0)$

Face up/down ? DOWN

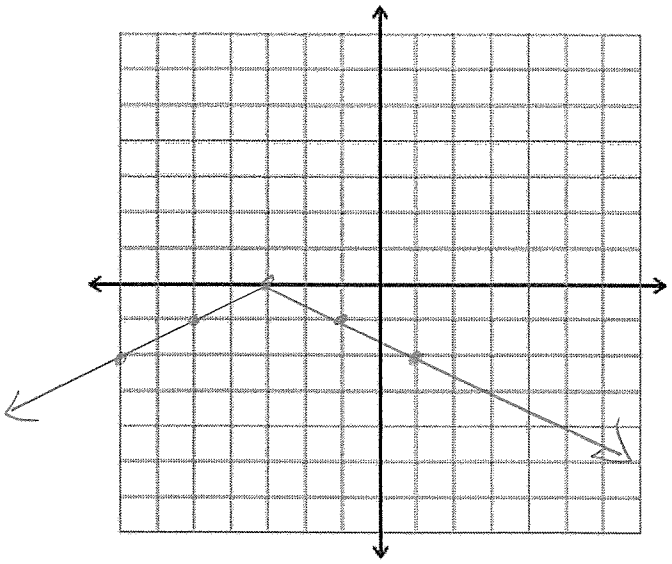


6. $y = -\frac{1}{2}|x+3|$

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

Vertex = $(-3,0)$

Face up/down ? DOWN

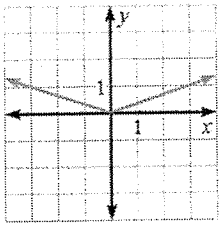


Advanced Algebra 2 Honors – Write Equations of Absolute Value Functions

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

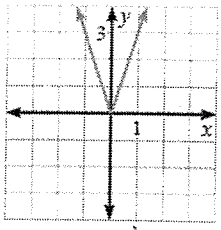
1.



vertex (0,0)

slope = $\frac{1}{3}$ $y = \frac{1}{3}|x|$

2.

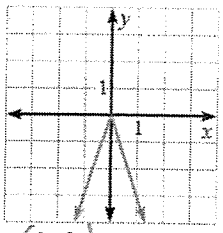


vertex (0,0)

slope = 3

$y = 3|x|$

3.

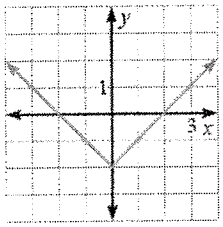


vertex (0,0)

slope = −3

$y = -3|x|$

4.

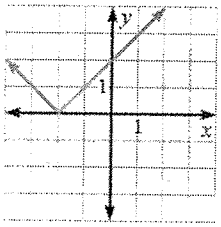


vertex (0,−2)

slope = 1

$y = |x| - 2$

5.

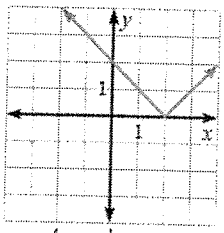


vertex (−2,0)

slope = 1

$y = |x+2|$

6.

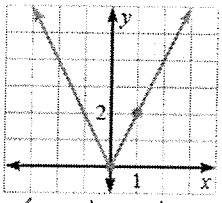


vertex (2,0)

slope = 1

$y = |x-2|$

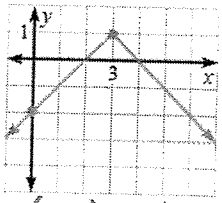
7.



vertex = (0,0) slope = 2

$y = 2|x|$

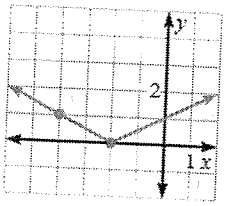
8.



vertex (3,1) slope = −1

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

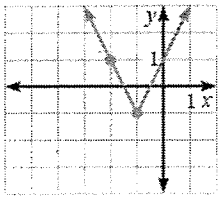
9.



vertex (−2,0) slope = $\frac{1}{2}$

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

10.

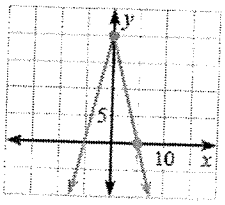


vertex (−1,−1)

slope = 2

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

11.

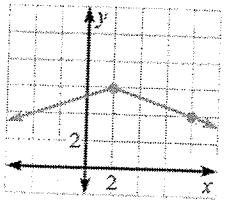


vertex (0,20)

slope = −4

$y = -4|x|+20$

12.

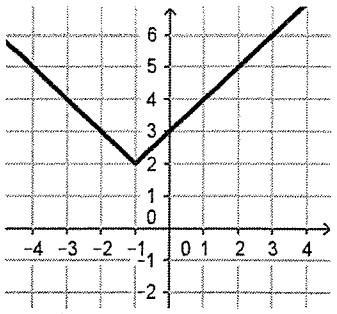


vertex (2,6)

slope = $-\frac{2}{6} = -\frac{1}{3}$

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

13]



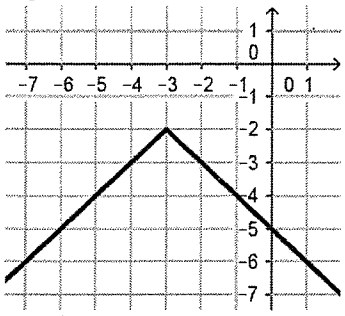
Equation:

vertex $(-1, 2)$

slope $= 1$

$y = |x+1| + 2$

14]



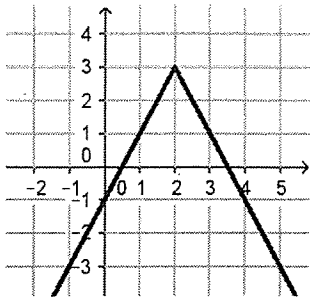
Equation:

vertex $(-3, -2)$

slope $= -1$

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

15]



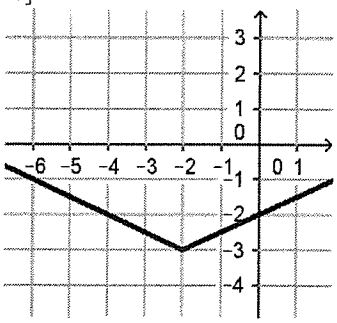
Equation:

vertex $(2, 3)$

slope $= -2$

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

16]



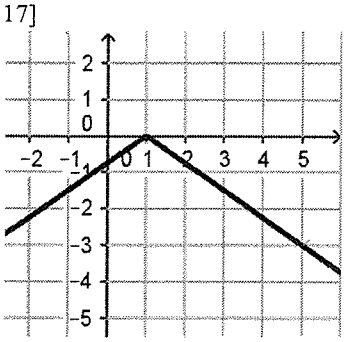
Equation:

vertex $(-2, -3)$

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

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

17]



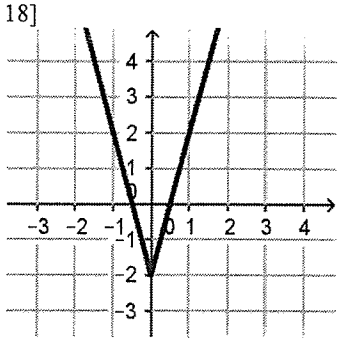
Equation:

vertex $(1, 0)$

slope $= -\frac{3}{5}$

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

18]



Equation:

vertex $(0, -2)$

slope $= 4$

$y = 4|x| - 2$