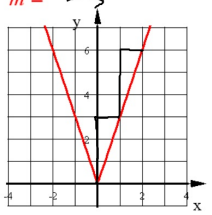
5. Graph

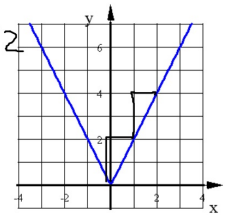
Column A	Column B
$y = 3\|x\|$	$y = 2\|x\|$

What is the slope of the two sides of each graph?

$y = 3|x|$
$m = \pm 3$



$y = 2|x|$
$m = \pm 2$



How is the slope of both sides of the graph related to what you see in the equation?

slope of the sides is ± coefficient

6. Does the graph of each absolute value function open up or down?

a) $y = 3|x| - 2$ up

b) $y = -7|x + 1|$ Down

c) $y = -\frac{1}{2}|x| + 4$ down

d) $y = 2|x - 3| - 5$ up

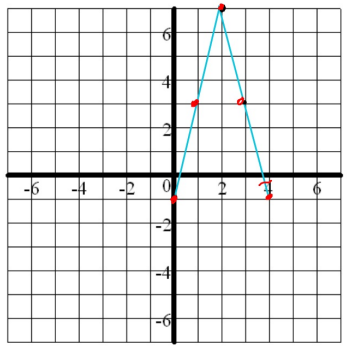
What part of the equation of an absolute value function determines if it opens up or down?

If the coefficient is positive "V" opens up

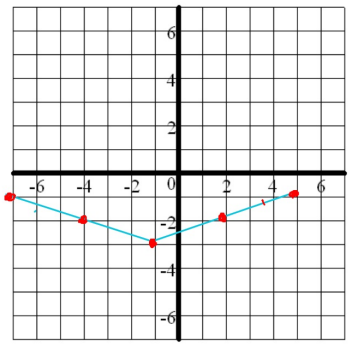
If coefficient is negative "V" opens down

7. Without using a table of values or a graphing calculator try to graph the following with at least five points.

a) $y = -4|x - 2| + 7$



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



Transformed Absolute Value Functions:

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

h: Horizontal Translation → |x + 3| means 3 units left
|x - 4| means 4 units right

k: Vertical Translation → |x| + 1 means 1 unit up
|x| - 5 means 5 units down

a: Vertical Stretch/Shrink Factor and which way it opens

Transformed Absolute Value Functions:

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

Vertex: (h,k)

Opens up if a>0

Opens down if a<0

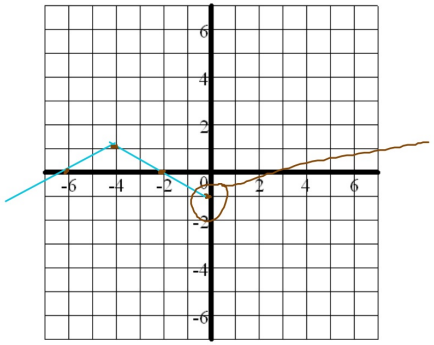
Slope of the sides of the graph: $m = \pm a$

Graph each with 5 points.

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

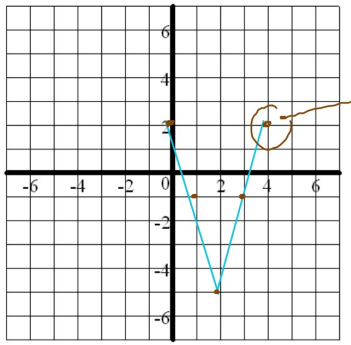
2. $y = 3|x-2|-4$

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



(0,-1)

2. $y = 3|x-2|-4$



(4,2)

Take a small white board, a marker, and a rag to wipe the board with.

Which way does each graph open?

1. $y = 0.25|x + 7| + 1$ Up

2. $y = 6|x - 8| - 14$ Up

Write the equation of the translation of $y = |x|$

1. 3 units right and 8 units up $(3, 8)$

$y = |x - 3| + 8$

2. 10 units left and 6 units down $(-10, -6)$

$y = |x + 10| - 6$

What is the vertex of the graph of this absolute value function?

$y = 2|x - 7| - 18$

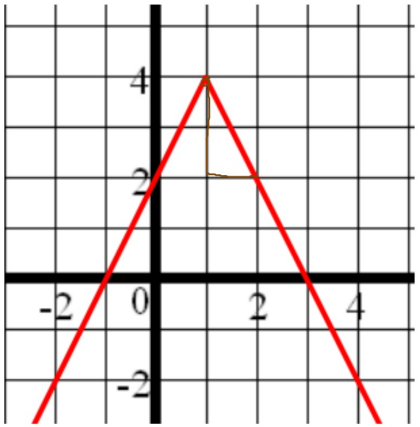
$(7, -18)$

Write the equation of this absolute value function

- Vertex is (-11,3)
- Slope of the sides are ± 5
- Opens down

$y = -5|x+11| + 3$

Write the equation of this absolute value function



$-2|x-1|+4$