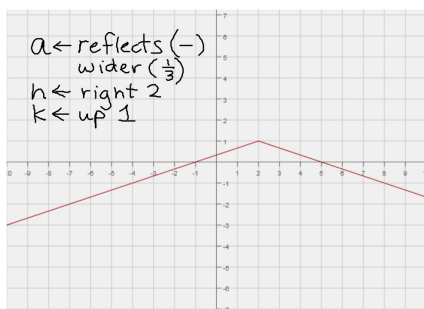


# DO NOW

Write the equation pictured in the graph.

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



Page 1

## 4.4 Graphing Absolute Value Functions - Day 3

Recall:  $f(x) = a|x-h| + k$

$a$ : reflecting and dilating

$h$ : horizontal translating (slide)

$k$ : Vertical translating (slide)

vertex:  $(h, k)$

axis of symmetry:  
 $x = h$

Page 2

1. Given:  $f(x) = -|x+3| - 4$

a. Describe the transformation from  $f(x) = |x|$

reflects in  $x$ -axis

Shift left 3 units

Shift down 4 units

b. Identify the vertex.

$(-3, -4)$

c. Identify the axis of symmetry.

$x = -3$

2. Given:  $y = -|x-6| + 4$

a. Identify the vertex.

$(6, 4)$

b. Identify the axis of symmetry.

$x = 6$

3. Given:  $g(x) = 3|x+5| + 2$

a. Identify the vertex.

$(-5, 2)$

b. Identify the axis of symmetry.

$x = -5$

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**Determine the equation from the description.**

4. Given the graph of  $y = |x+4| - 3$ , what would be the equation of this same graph if it was shifted left one unit and down two units?

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

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

5. Given the graph of  $y = -|x-1| - 4$ , what would be the equation of this same graph if it was shifted right three units and down two units?

$$y = -|x-1-3| - 4 - 2$$

$$y = -|x-4| - 6$$

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6. Given the equations predict the differences in the graphs.

Confirm your predictions by graphing the set of functions on the same  $xy$ -plane.

$$y = |x| + 5$$

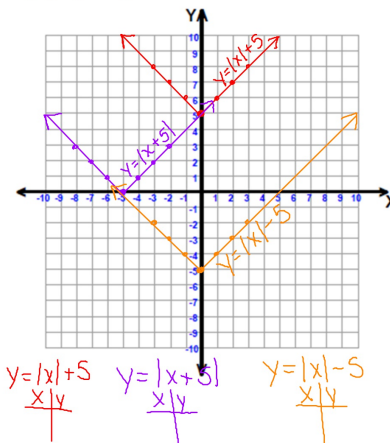
$$y = |x+5|$$

$$y = |x| - 5$$

$y = |x| + 5$  will shift up 5 units, vertex at  $(0, 5)$

$y = |x+5|$  will shift left 5 units, vertex at  $(-5, 0)$

$y = |x| - 5$  will shift down 5 units, vertex at  $(0, -5)$



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# **HOMEWORK**

Worksheet - HW 4.4 - Day 3