

## NOTES: Section 2.7 – Use Absolute Value Functions and Transformations

Goals: #1 – I can solve an absolute value equation in order to find the  $x$ -intercepts of an absolute value graph.

#2 – I can graph absolute value equations and describe if the function is a stretch, shrink, reflection, and/or translation of the parent function.

#3 – I can graph the transformation of a function by identifying a stretch, shrink, reflection, and/or translation of the parent function,  $f(x)$ .

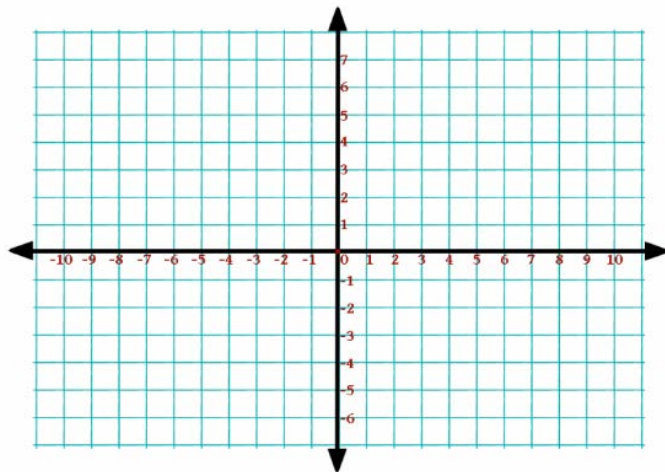


*Homework: Lesson 2.7 Worksheet*

**Exploration #1:** Fill in the table and graph the function.

1.  $f(x) = |x|$

$x$	$f(x)$
-4	
-2	
0	
2	
4	



2. Describe what happens to the *vertex* when Ms. Hentrich does the following:

a.  $f(x) = |x| + 5$

b.  $f(x) = |x + 5|$

c.  $f(x) = |x + 5| + 5$

d.  $f(x) = -|x|$

e.  $f(x) = 5|x|$

f.  $f(x) = \frac{1}{5}|x|$

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

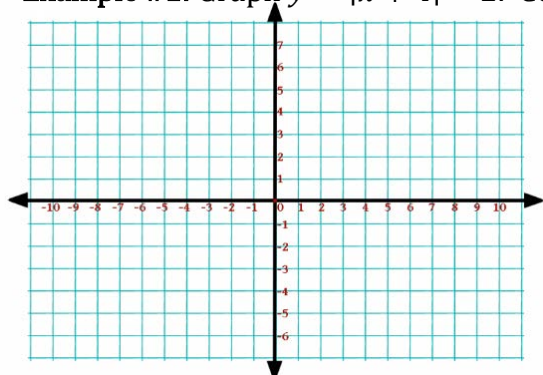
Transformation	$f(x)$ Notation	Examples
<b>Vertical Translation</b> <i>(shift up and down)</i>	<i>Shift Up</i>  <i>Shift Down</i>	
<b>Horizontal Translation</b> <i>(shift left and right)</i>	<i>Shift Left</i>  <i>Shift Right</i>	
<b>Reflection</b> <i>(in the x-axis)</i>		
<b>Vertical Stretch/Shrink</b> <i>(narrower and wider)</i>	<i>Narrower</i>  <i>Wider</i>	

**Notes:**

A \_\_\_\_\_ changes a graph's size, shape, position, or orientation.

A \_\_\_\_\_ is a type of transformation that shifts a graph horizontally and/or vertically, but does \_\_\_\_\_ change its size, shape, or orientation.

**Example #1:** Graph  $y = |x + 4| - 2$ . Compare the graph with the graph of  $y = |x|$ .



$x$				
$y$				

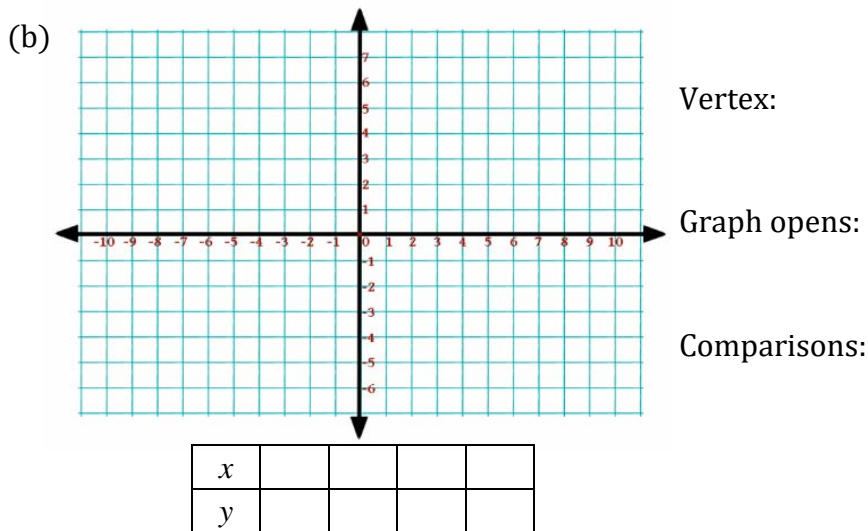
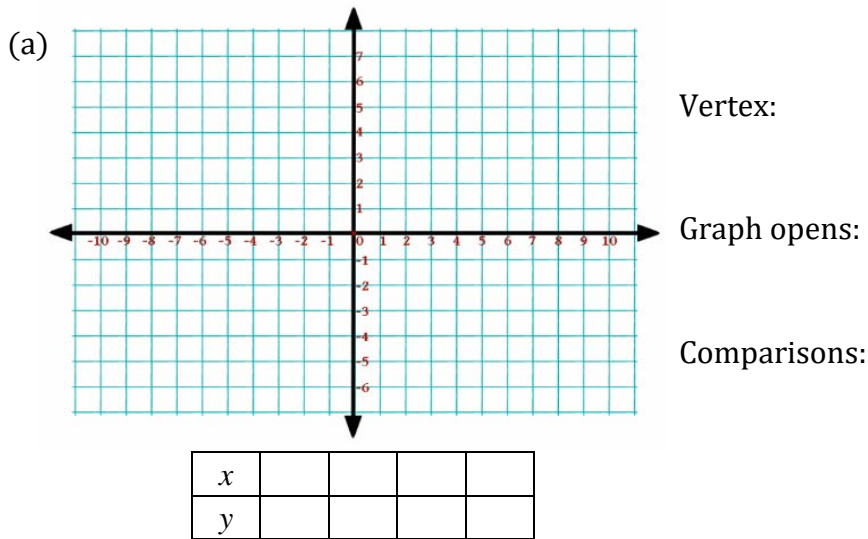
Vertex:

Graph opens:

Comparisons:

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

**Example #2:** Graph (a)  $y = \frac{1}{2}|x|$  and (b)  $y = -3|x|$ . Compare each graph with the graph of  $y = |x|$ .



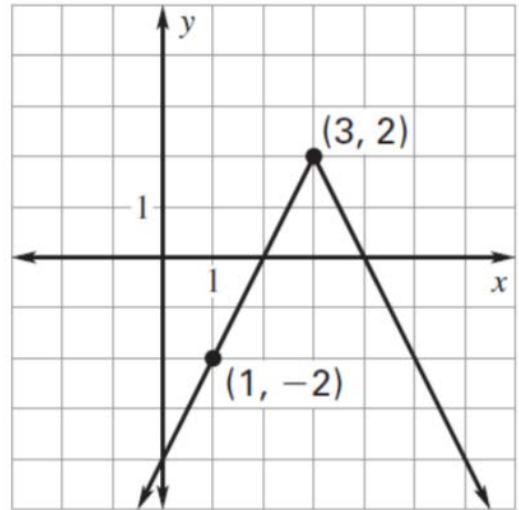
**Notes:**

The graph of \_\_\_\_\_ can involve a vertical stretch or shrink, a reflection, and a translation of the graph of \_\_\_\_\_.

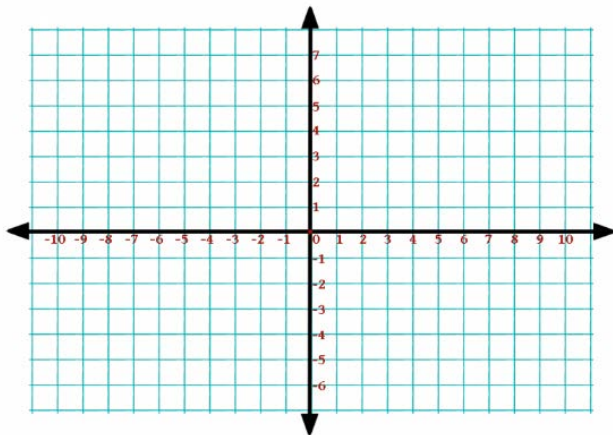
The vertex of  $y = a|x - h| + k$  is \_\_\_\_\_.

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

**Example #3:** Write an equation for the graph shown.



**Example #4:** Graph  $y = -2|x - 1| + 3$ . Compare the graph with the graph of  $y = |x|$ .



Vertex:

Graph opens:

Comparisons:

$x$				
$y$				

**Example #5:** Refer to the following function:  $y = -\frac{7}{2}|x - 2| + 4$ . Compare the graph of this function to the graph of the function  $y = |x|$ . Make a bulleted list. Use terminology that we learned today.