NOTES: KEY FEATURES (ABS VAL FUNCTIONS) DAY 2

Textbook Chapter 2.7

OBJECTIVE: Today you will look at key features of absolute value graphs such as domain and range, max/min, increasing/decreasing, intercepts, and end behavior.

Fill out the chart.

	EQUATION	OPEN	VERTEX (initial point)	SHIFT (horizonal/vertical)	VERTICAL CHANGE
1	$y=\|x-3\|+5$	(Up) Down	(3 , 5)	Left (Right) 3 (Up) Down 5	Stretch Shrink (None)
2	$y=2\|x+1\|-3$	(Up) Down	(-1 , -3)	(Left) Right 1 Up (Down) 3	(Stretch) Shrink None
3	$y=-\|x-6\|$	Up (Down)	(6 , 0)	Left (Right) 6 Up Down 0	Stretch Shrink (None)
4	$y=\frac{3}{4}\|x-1\|$	(Up) Down	(1 , 0)	Left (Right) 1 Up Down 0	Stretch (Shrink) None
5	$y=-\|x\|+10$	Up (Down)	(0 , 10)	Left Right 0 (Up) Down 10	Stretch Shrink (None)

6. Create an absolute value function that:

- Opens down
- Is vertically stretched
- Is shifted left 5
- Is shifted down 1

Y = $2|x+5|-1$

7. What is the domain of every absolute value function? Why?

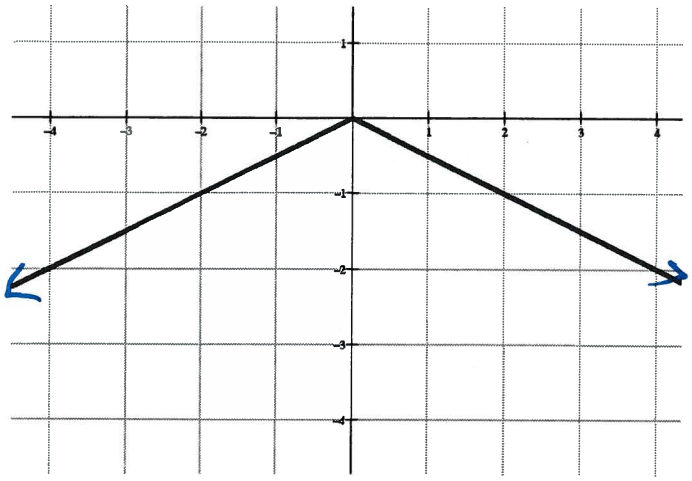
All real numbers.

8. How can you look at an equation of any absolute value function and find the range?

If a is positive, $[k, \infty)$ is the range.

If a is negative, $(-\infty, k]$ is the range.

9. Fill in the blanks about the graph



End Behavior:

As $x \to +\infty$ then $f(x) \to$ $-\infty$

As $x \to -\infty$ then $f(x) \to$ $-\infty$

Domain: $(-\infty, \infty)$

Range: $(-\infty, 0]$

Increasing: $(-\infty, 0)$

Decreasing: $(0, \infty)$

Absolute Max: 0

Absolute Min: Does not exist

Relative Max: 0

Relative Min: Does not exist

10. Circle all graphs that have a range of: [1, ∞). There could be more than one answer.

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

11. Circle all the functions where the vertex is a maximum. There could be more than one answer.

$y=-|x+5|$ $y=|x|-5$ $y=-2|x-3|$ $y=-100|x|$

12. Circle all the graphs that have a turning point of (2, 0).

$y=-|x+2|+0$ $y=-|x-2|$ $y=\frac{1}{9}|x|-2$