Name _____ Date _____

3.7

Learning Target: Understand how to write and graph linear functions.

I can graph and describe transformations of graphs of absolute value functions.

Write the meaning of each vocabulary term.

absolute value function - function with an absolute value expression
- variable is inside ab.v. bars.

vertex - see below

vertex form: $y = a|x-h| + k$ (x coor., y coor.) vertex (h, k)

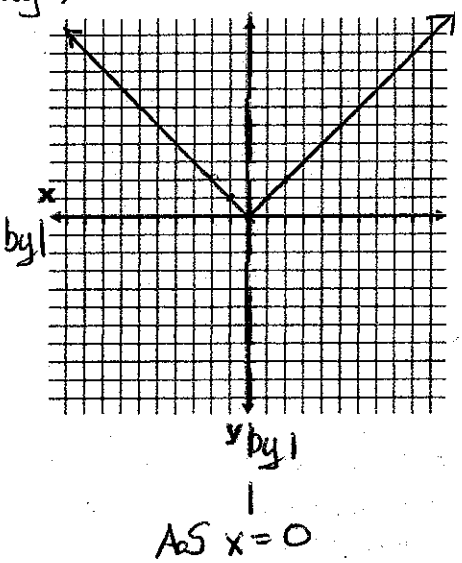
Graph of Ab. Value Function (2nd family)

~ consist of 2 rays with a common endpoint called the vertex

~ parent $f(x) = |x|$

vertex $(0,0)$ D: $\mathbb{R}$ R: $\{y \geq 0\}$

x	f(x)
-2	2
-1	1
0	0
1	1
2	2



All ab. value graphs have an axis of symmetry ⇒ vertical line thru vertex

$x =$

AoS

$y = a|x-h| + k$ Vertex (h,k)

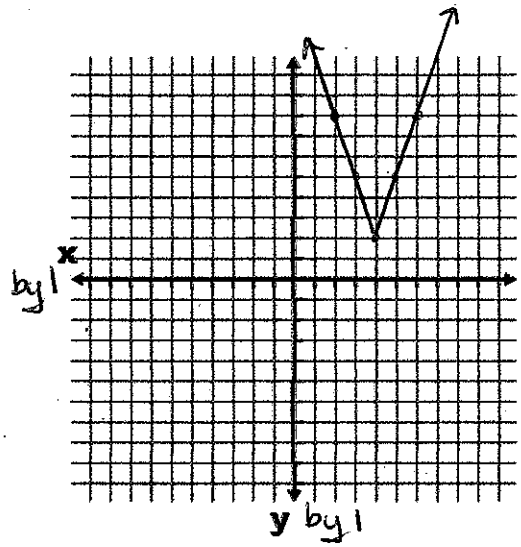
Methods for graphing absolute value functions.

1. Use a table - find vertex 1st

$f(x) = 3|x-4| + 2$

x	f(x)
2	8
3	5
4	2
5	5
6	8

$f(2) = 3|2-4| + 2$
$= 3|-2| + 2$
$= 3 \cdot 2 + 2 = 8$

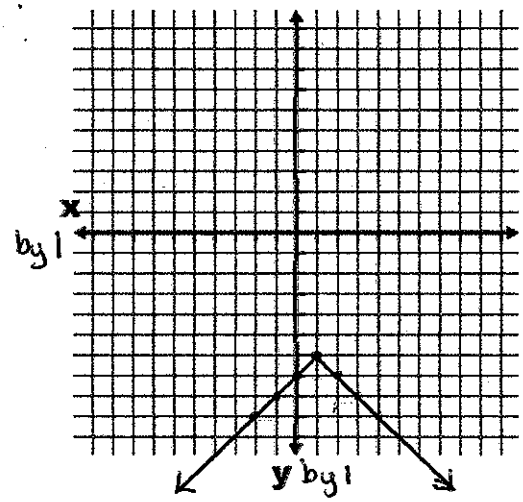


2. Plot the vertex, use "a" as the slope for the right ray.

$f(x) = -|x-1| - 6$

Vertex $(1,-6)$ $a = -1 = \frac{-1}{1}$

slope of left ray 1



3. Use transformations: vertical stretch, hor. shift left, v. shift up

$f(x) = 2|x+3| + 1$

$y = |x|$

x	y
-2	2
-1	1
0	0
1	1
2	2

$\cdot 2$

$y = 2|x|$

x	y
-2	4
-1	2
0	0
1	2
2	4

-3 from x, $+1$ to y

x	y
-5	5
-4	3
-3	1
-2	3
-1	5