

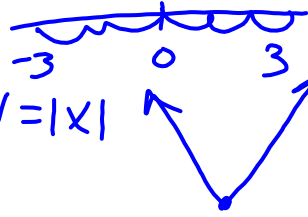
2-6 Special Functions

- functions that are not linear, but have linear characteristics

Absolute Value Functions



$$y = |x|$$



Step Functions

$$y = \lfloor x \rfloor \quad \lfloor 1.9999999 \rfloor$$

Piecewise Functions



2-6A Absolute Value Functions

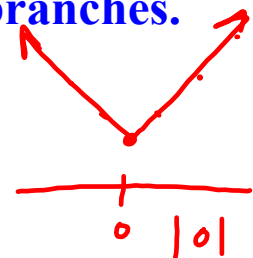
$$y = mx + b$$

$$y = a |bx - c| + d$$

- vertex is the only point that does not have symmetry.
- special type of piecewise functions.
- a , b , or ab represents the "slope" of the branches.

To Graph - must plot at least 5 points

- vertex | $| = 0$
- 2 points on the left branch of graph
- 2 points on the right branch of graph
- use a t-table of values and/or slope
- absolute value graphs are symmetrical

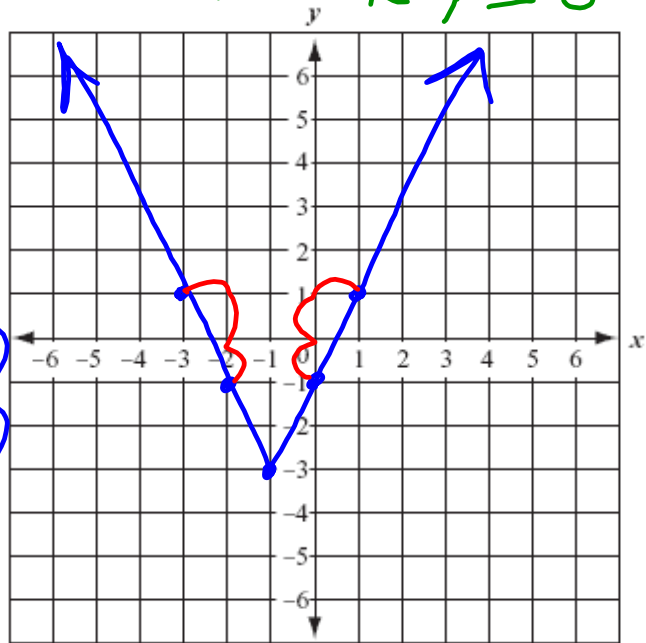


Examples: Graph the following absolute value functions. Then determine the domain and range of each. $D: \mathbb{R}$ $R: y \geq -3$

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

$x + 1 = 0$
 $x = -1$
 $V(-1, -3)$
 $m = \pm 2$

x	y
-3	1
-2	-1
-1	-3
0	-1
1	1



Find $f(-3) = 1$

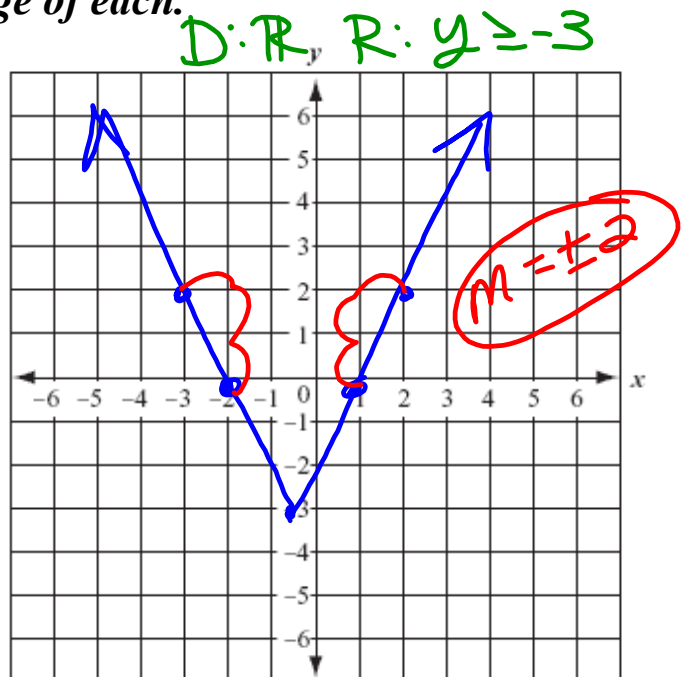
Find $f(7) = 13$

Examples: Graph the following absolute value functions. Then determine the domain and range of each. $D: \mathbb{R}$ $R: y \geq -3$

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

$2x + 1 = 0$
 $2x = -1$
 $x = -\frac{1}{2}$
 $V(-\frac{1}{2}, -3)$

x	y
-3	2
-2	0
$-\frac{1}{2}$	-3
1	0
2	2



Examples: Graph the following absolute value functions. Then determine the domain and range of each.

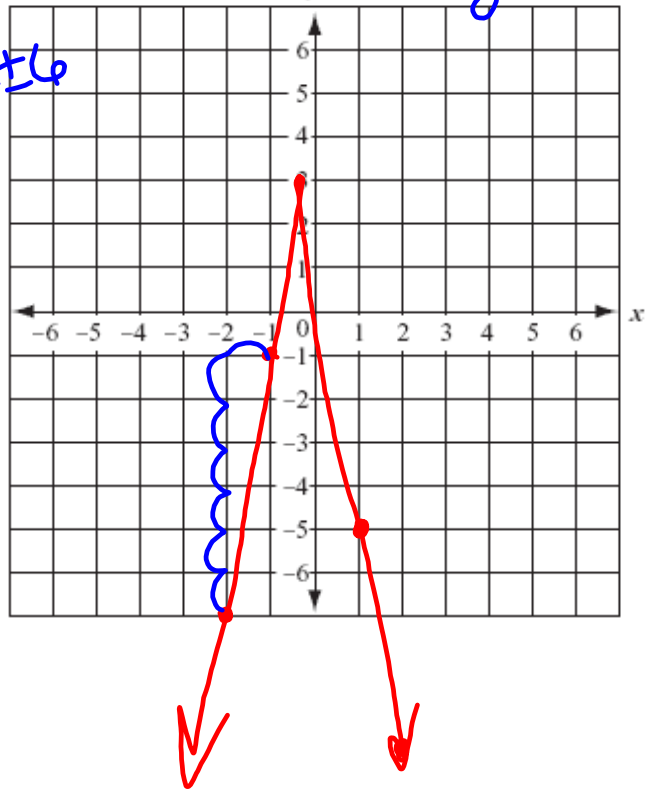
$D: \mathbb{R} \quad R: y \leq 3$

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

$m = \pm 6$

$3x + 1 = 0$
 $3x = -1$
 $x = -\frac{1}{3}$
 $\checkmark (-\frac{1}{3}, 3)$

x	y
-2	-7
-1	-1
$-\frac{1}{3}$	3
1	-5
2	-11



Graph the following inequalities.

4. $y \geq |x - 1| + 2$

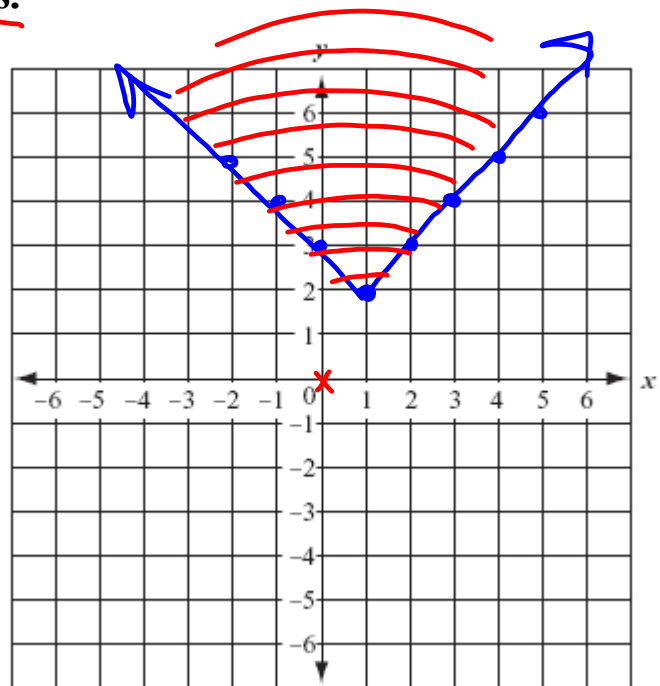
$x - 1 = 0$
 $x = 1$
 $\checkmark (1, 2)$

$m = \pm 1$
 $(0, 0)$

$0 \geq |0 - 1| + 2$

$0 \geq |1 - 1| + 2$

$0 \neq 3$





2-6 Absolute Value Worksheet

3. $h(x) < |x| + 1$ 4. $g(x) \leq |x + 1|$

9. $h(x) > |3x - 1| + 2$ 10. $h(x) \geq \frac{1}{5}|2x - 7| - 3$

