

## Today's Plan:

**Learning Target (standard):** I will graph functions and find the domain and range of them.

**Students will:** Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

**Teacher will:** Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

**Assessment:** Board work, homework check and homework assignment

**Differentiation:** Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

Find the exclusions from the domain. Use those to find the domain of the function.

$$f(x) = \sqrt{2x+6} \geq 0 \quad 2x+6 < 0$$

$$\text{exclusions: } \{x \mid x < -3\} \quad \begin{array}{l} 2x < -6 \\ x < -3 \end{array}$$

$$D: \{x \mid x \geq -3\}$$

Find the exclusions from the domain. Use those to find the domain of the function.

$$f(x) = \frac{2x+3}{\sqrt{4-x}}$$

$$4-x \leq 0$$

$$-x \leq -4$$

exclusions:  $\{x \mid x \geq 4\}$   $x \geq 4$

D:  $\{x \mid x < 4\}$

Find the exclusions from the domain. Use those to find the domain of the function.

$$f(x) = \frac{\sqrt{x+4}}{x}$$

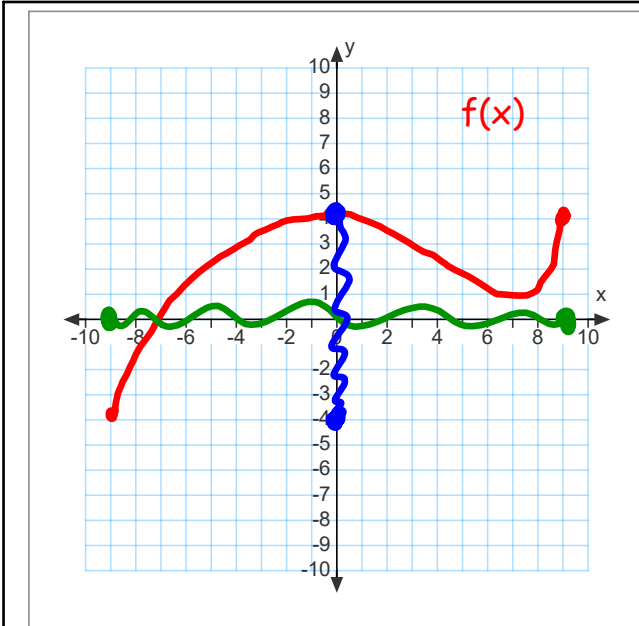
$$x+4 < 0$$

$$x < -4$$

$$x = 0$$

exclusions:  $\{x \mid x < -4, x = 0\}$

D:  $\{x \mid x \geq -4, x \neq 0\}$



$$D: \{x \mid -9 \leq x \leq 9\}$$

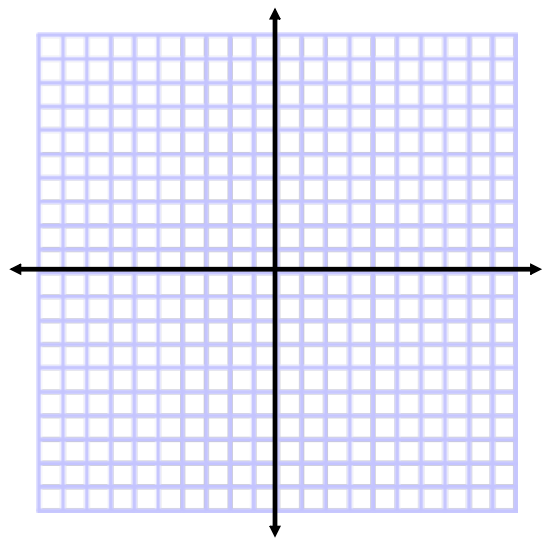
$$R: \{y \mid -4 \leq y \leq 4\}$$

Types of Functions:

1)  $f(x) = mx + b$

$m =$  "linear"

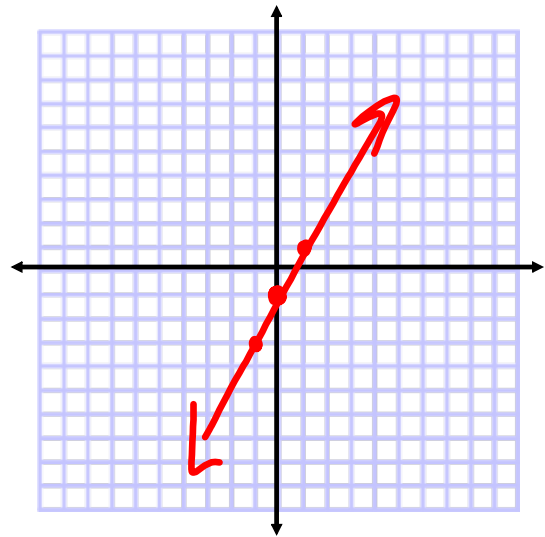
$I_y :$



Graph. State domain and range.

$f(x) = 2x - 1$   $m = 2$   
 $I_y: (0, -1)$

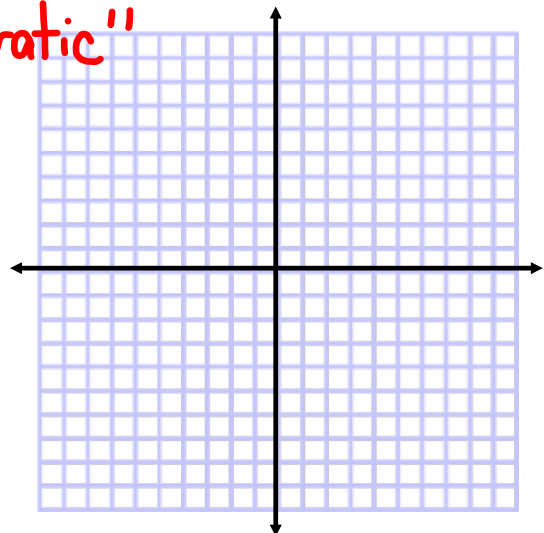
D:  $\mathbb{R}$   
 R:  $\mathbb{R}$



2)  $f(x) = ax^2 + bx + c$  "quadratic"

vertex:  $(-\frac{b}{2a}, \text{plug in } x)$

x	y
vertex	



Graph. State domain and range.

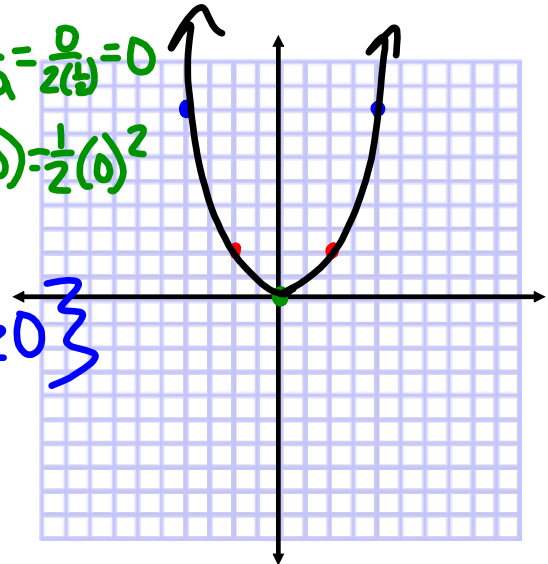
$$f(x) = \frac{1}{2}x^2$$

vertex:  $(0, 0)$   
 $x = -\frac{b}{2a} = \frac{0}{2(\frac{1}{2})} = 0$   
 $f(0) = \frac{1}{2}(0)^2$

x	y
-4	8
-2	2
0	0
2	2
4	8

D:  $\mathbb{R}$

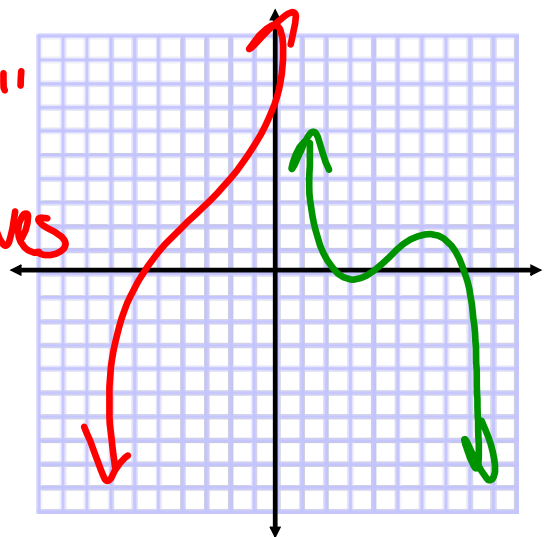
R:  $\{y \mid y \geq 0\}$



3)  $f(x) = ax^3 + bx^2 + cx + d$

x	y
-2	
-1	
0	
1	
2	

"cubic"  
 -S-curves

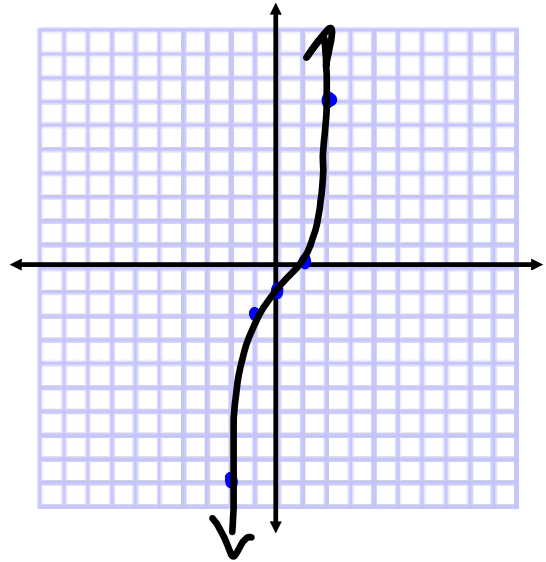


Graph. State domain and range.

$$f(x) = x^3 - 1$$

x	y
-2	-9
-1	-2
0	-1
1	0
2	7

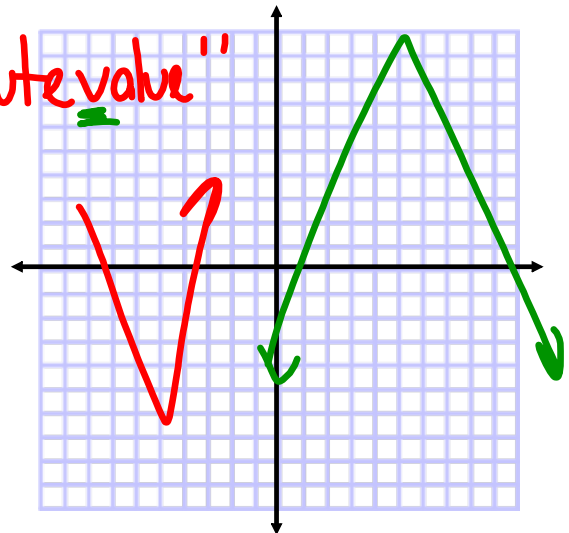
D:  $\mathbb{R}$   
 R:  $\mathbb{R}$



4)  $f(x) = a | \underline{bx + c} | + d$

vertex:  $(bx+c=0, \text{ plugin } x)$  "absolute value"

x	y
vertex	



Graph. State domain and range.

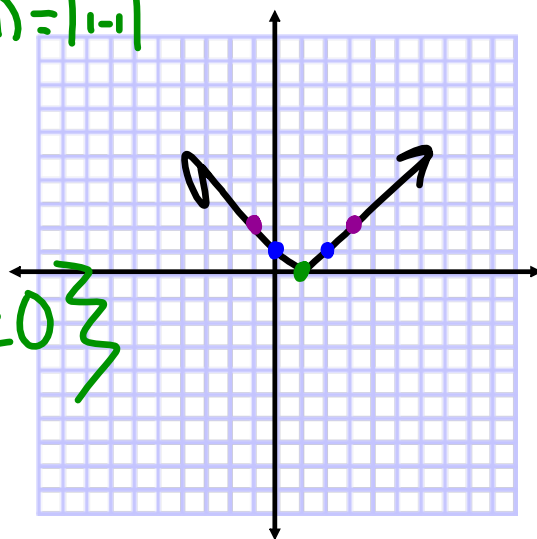
$$f(x) = |x - 1| \quad \text{vertex: } (1, 0)$$

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

$$D: \mathbb{R}$$

$$R: \{y \mid y \geq 0\}$$

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



Assignment:

p.394 #2-16 even

Graph each function using the criteria from class. Find the function's domain & range.