

# 4.5: Domain and Range

SWBAT identify the domain and range of a function.

Assignment:

HW28

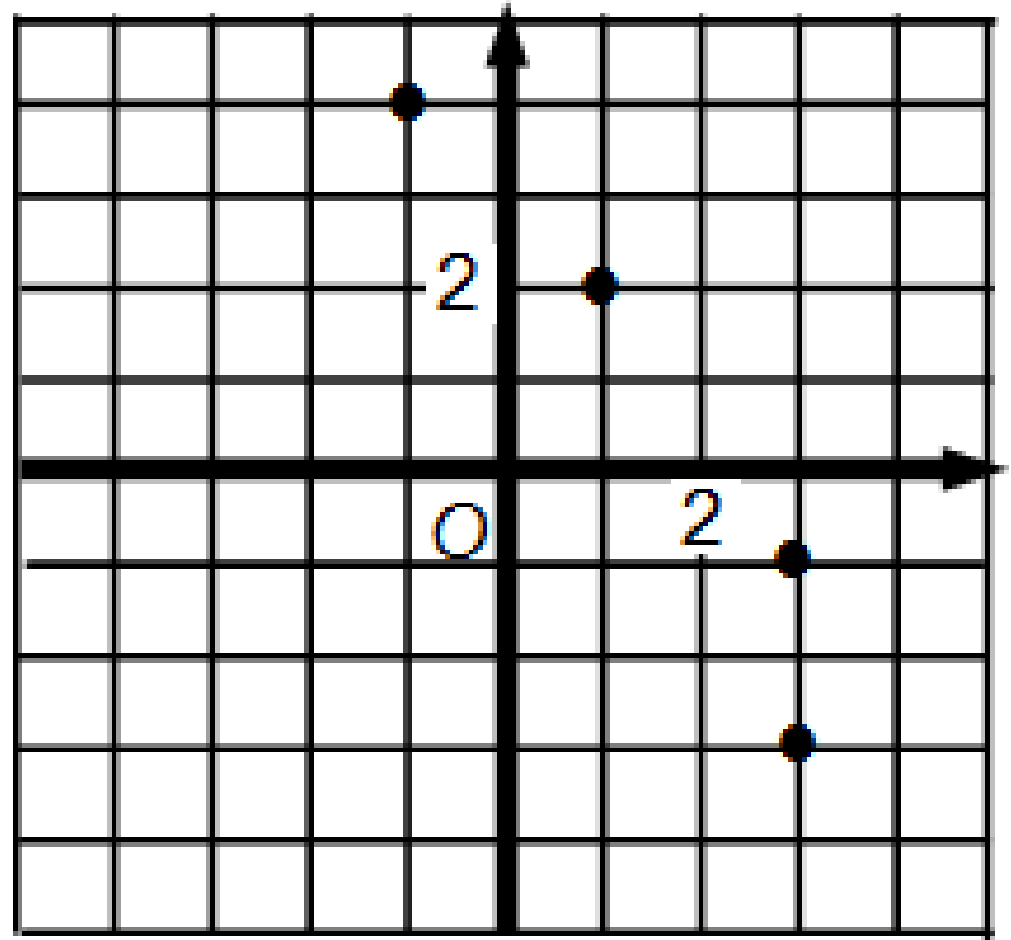
# Review

- ▶ Definitions:
- ▶ Function
  - ▶ A special relation where one input is matched with *exactly* one output
- ▶ Domain
  - ▶ The set of (possible) inputs
- ▶ Range
  - ▶ The set of (possible) outputs

# Domain and Range

The Domain:

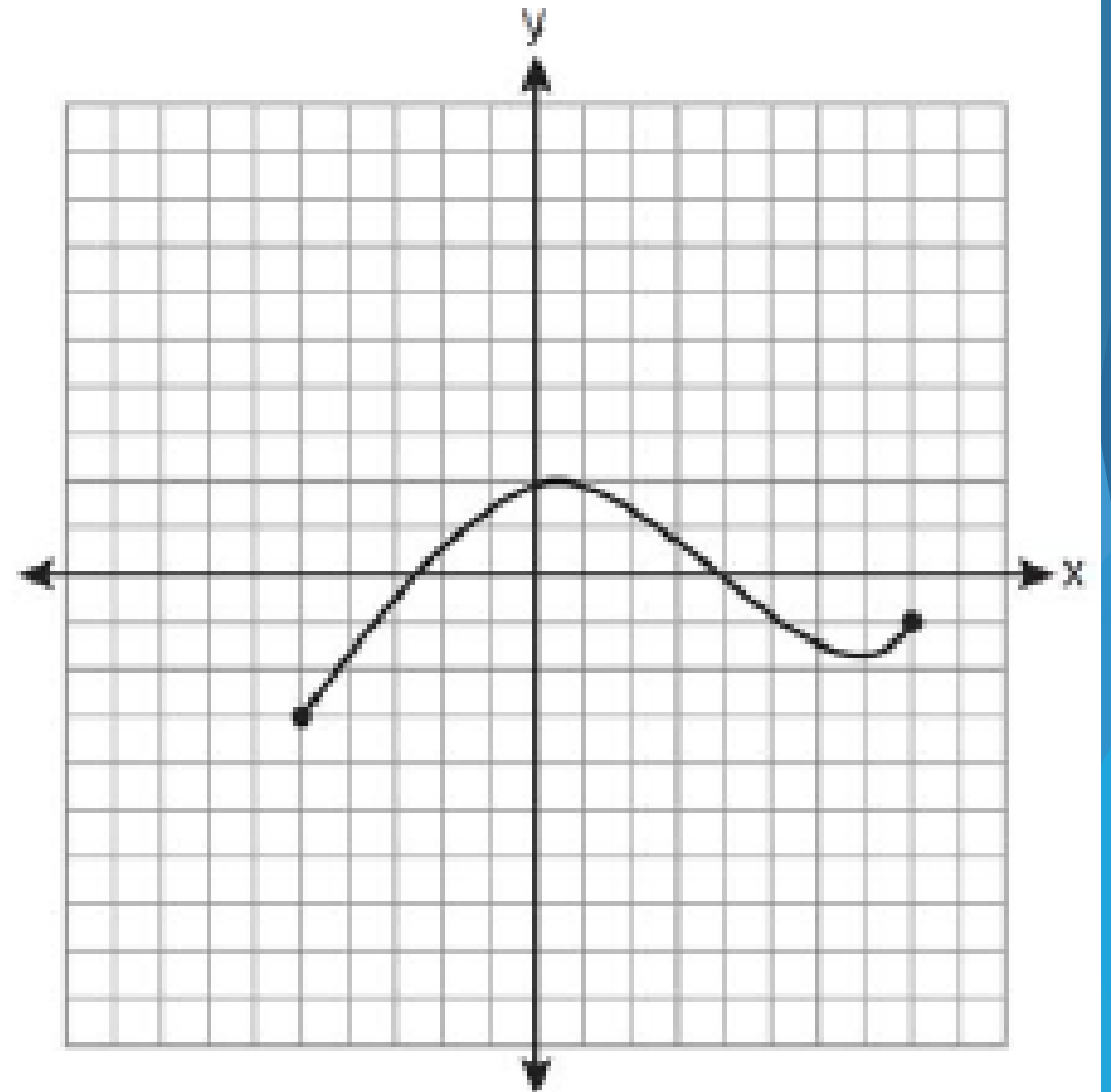
The Range:



## Domain and Range

The Domain:

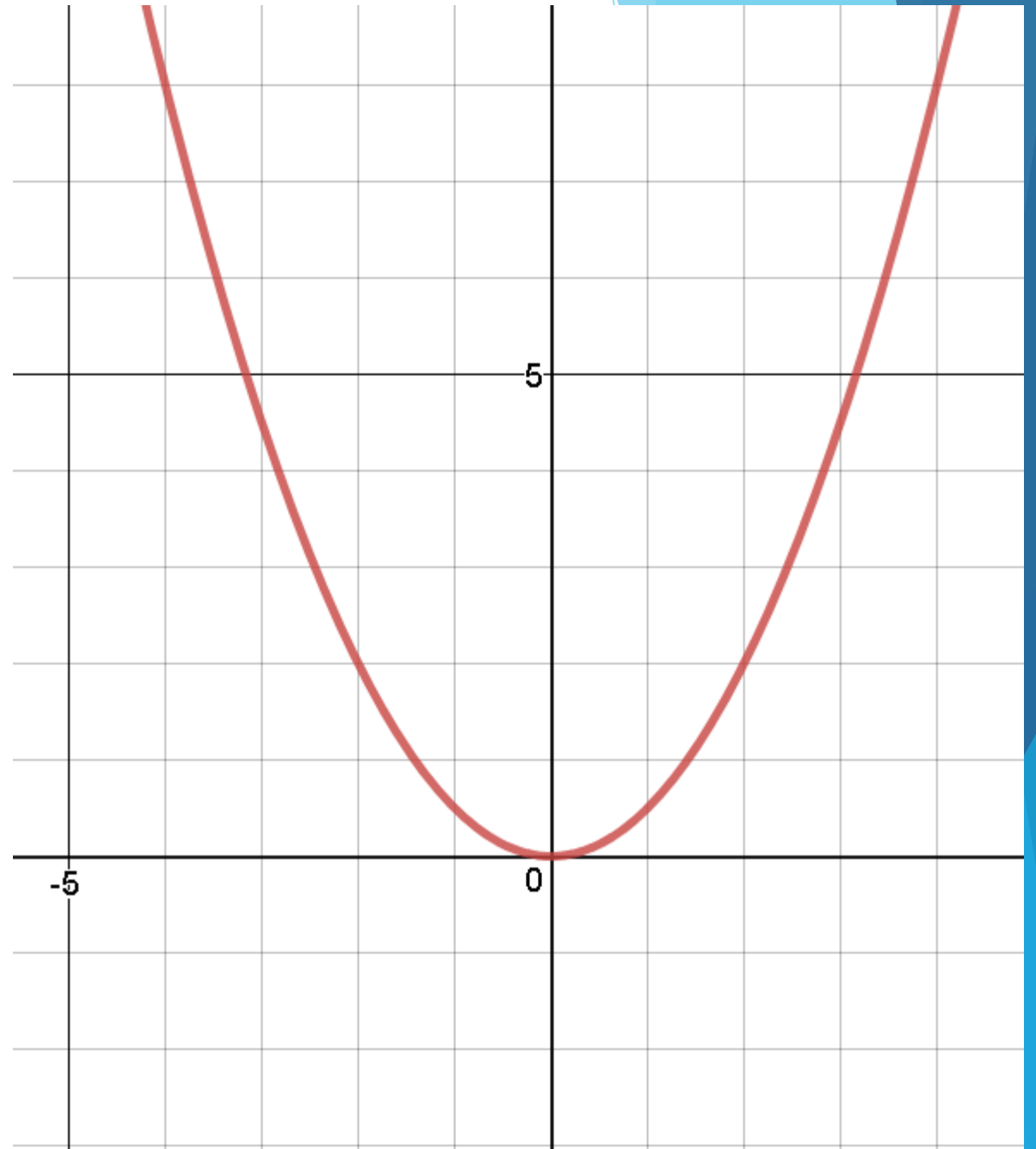
The Range:



## Domain and Range

The Domain:

The Range:



# Notation

## Inequality

$$3 \leq x < 10$$

- ▶  $x$  is between 3 and 10
- ▶ Closed dot gets the “or equal to” line; open dot does not

$$x \leq 10$$

- ▶ The smallest  $x$  is  $\infty$ ; the biggest is 10

## Interval Notation

$$[3,10)$$

- ▶ Closed dot gets bracket
- ▶ Open dot gets parentheses
- ▶ Smallest number, then biggest number
- ▶ Infinity always gets parentheses
- ▶ Examples:  $(-7,5]$ ,  $(-\infty, \infty)$ ,  $[2, 9]$

# 4.6: Graphing

SWBAT identify and graph four basic functions (linear, quadratic, absolute value, and square root) and identify their domain and range.

# Graphing Functions

- ▶ When we graph the function  $f$ , we are really graphing  $y=f(x)$
- ▶ We have already graphed one kind of function: *linear functions*, which give us a line, by identifying slope and y-intercept
- ▶ You can also graph linear functions, and other kinds of functions, by creating a table of values.
- ▶ Your table of values should include at least 3-5 points. The domain  $\{-2, -1, 0, 1, 2\}$  is usually a good place to start.



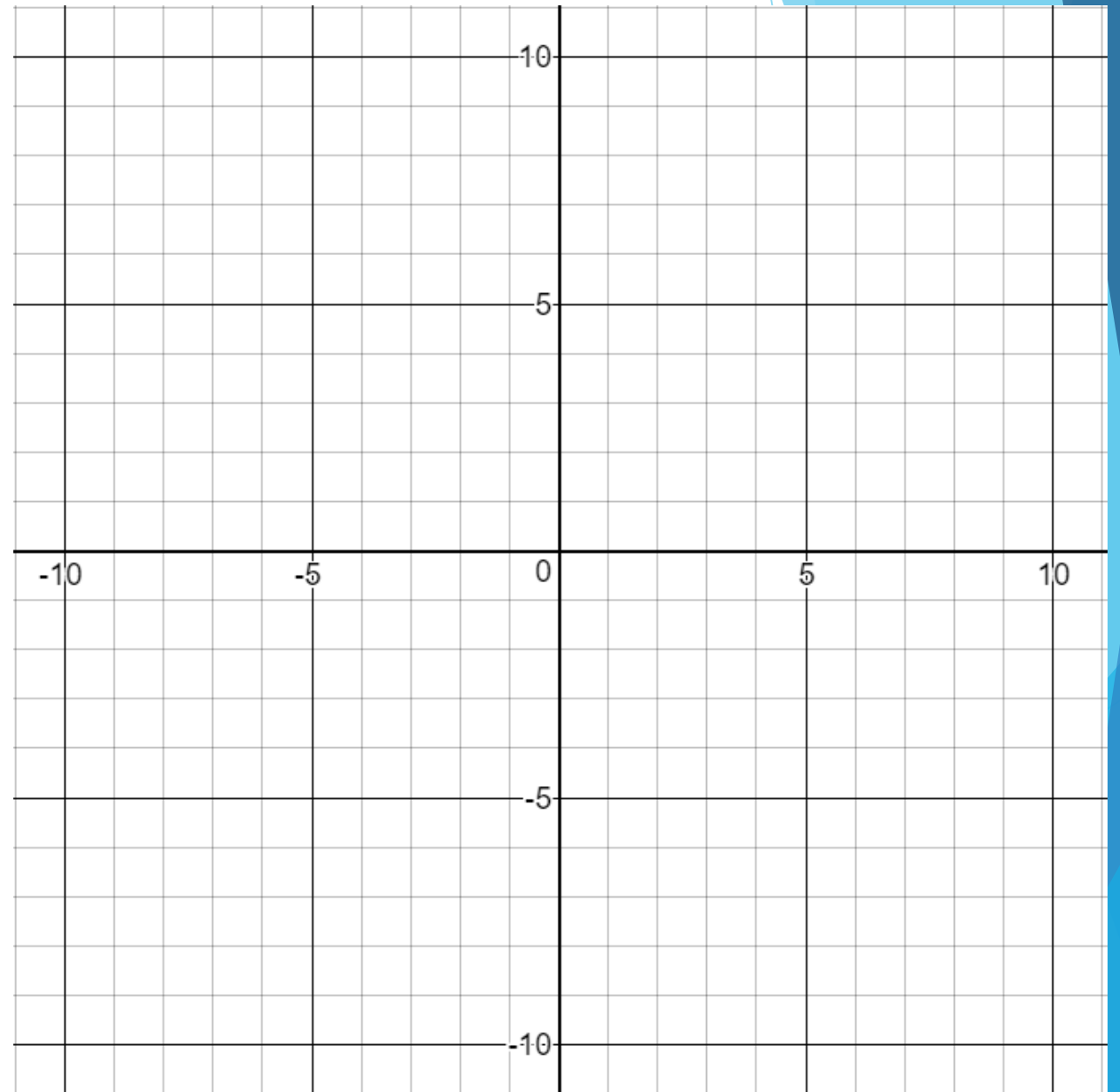
# Linear Functions

1.  $f(x) = x$

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

Domain:

Range:



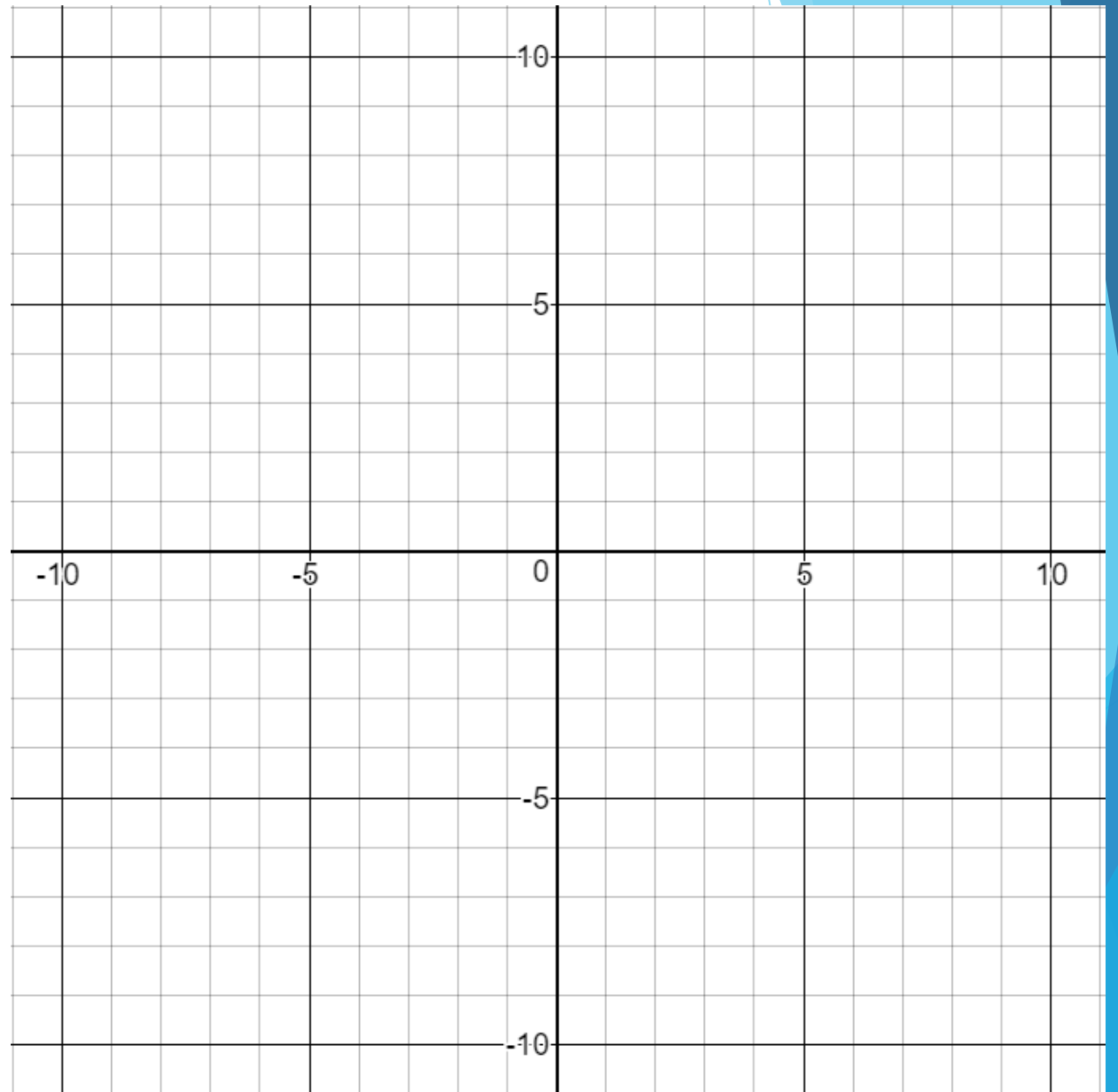
# Absolute Value Functions

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

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

Domain:

Range:



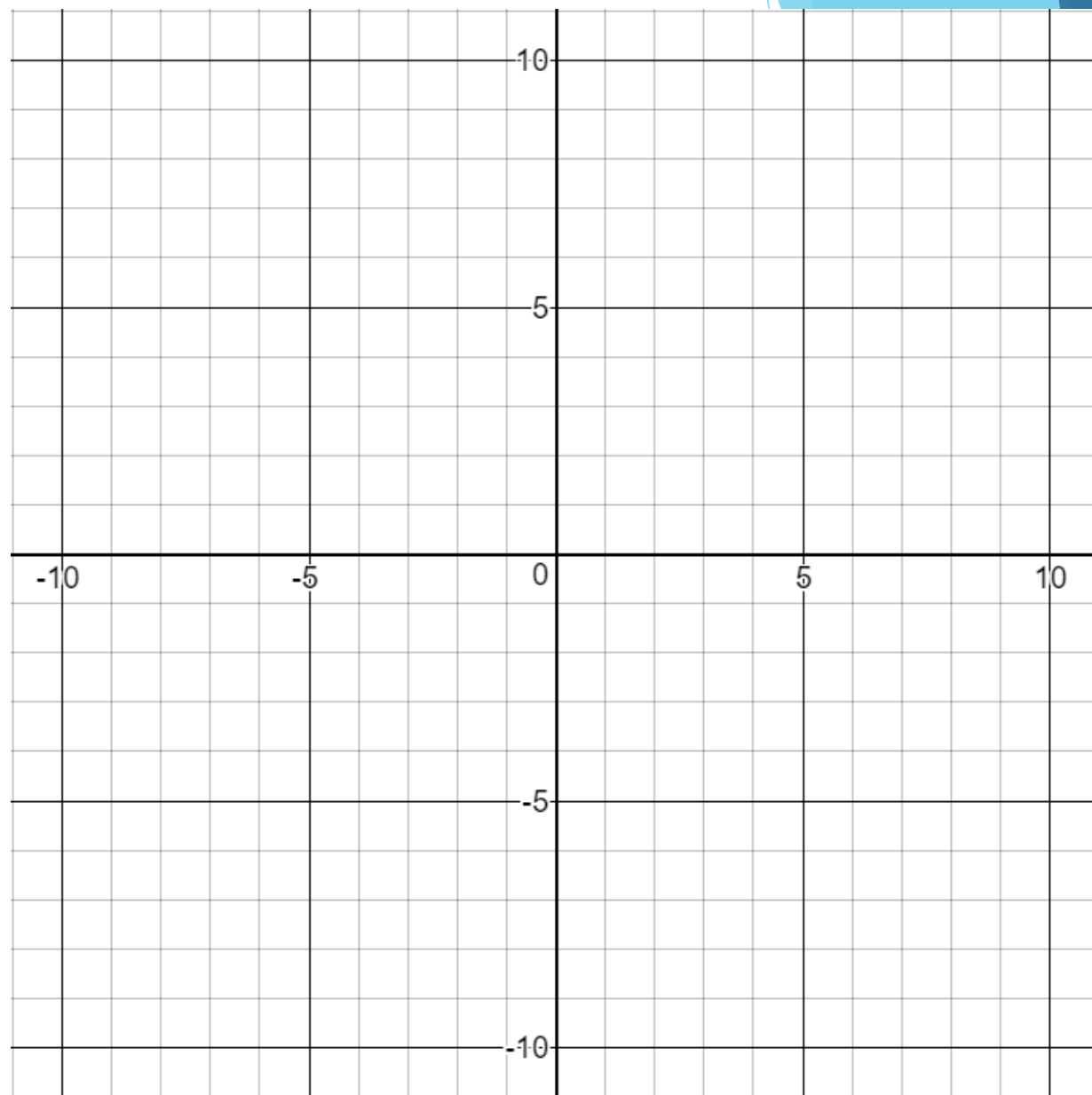
# Quadratic Functions

1.  $f(x) = x^2$

$x$	$f(x)$
-3	
-2	
-1	
0	
1	
2	
3	

Domain:

Range:



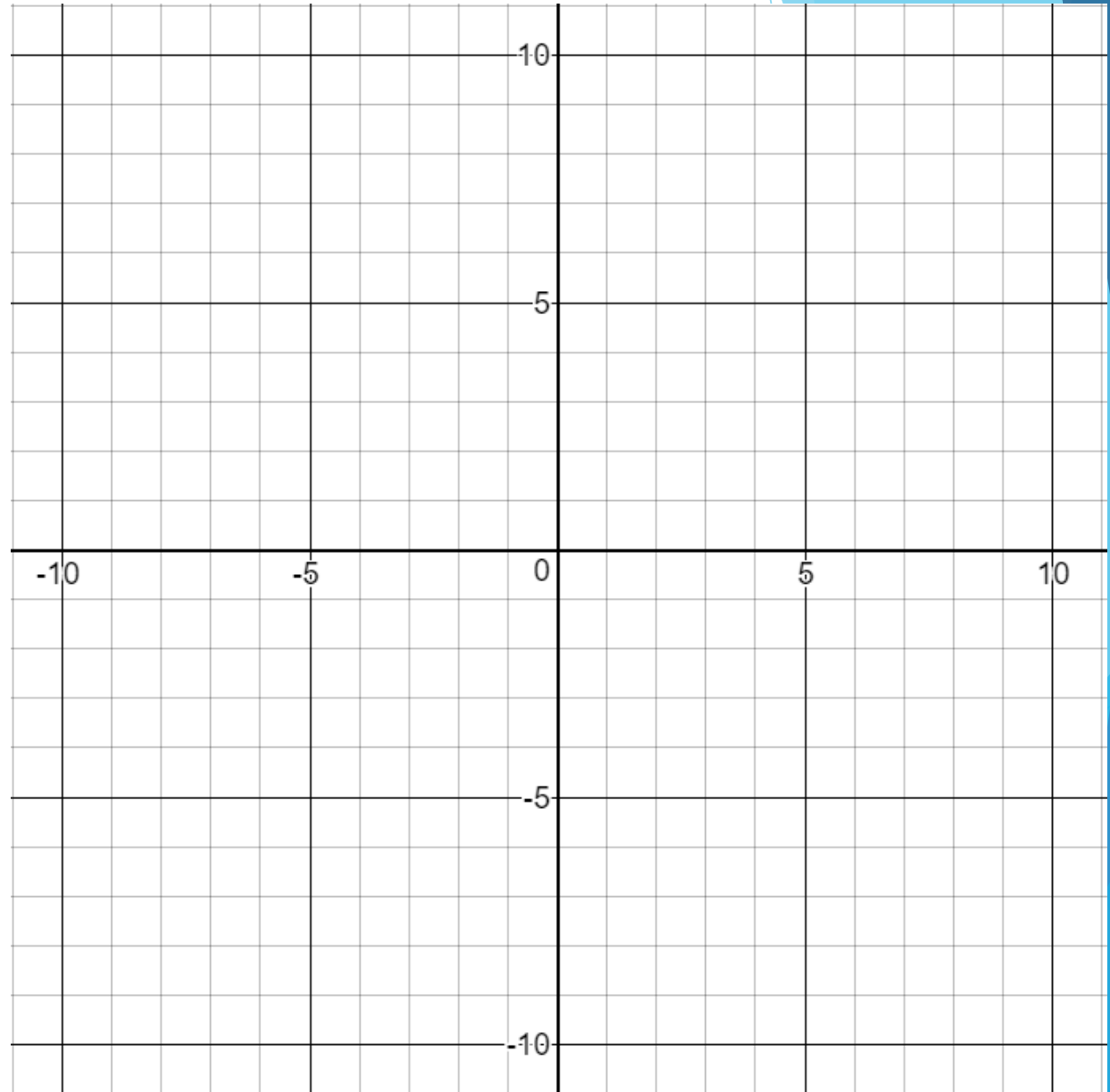
# Square Root Functions

1.  $f(x) = \sqrt{x}$

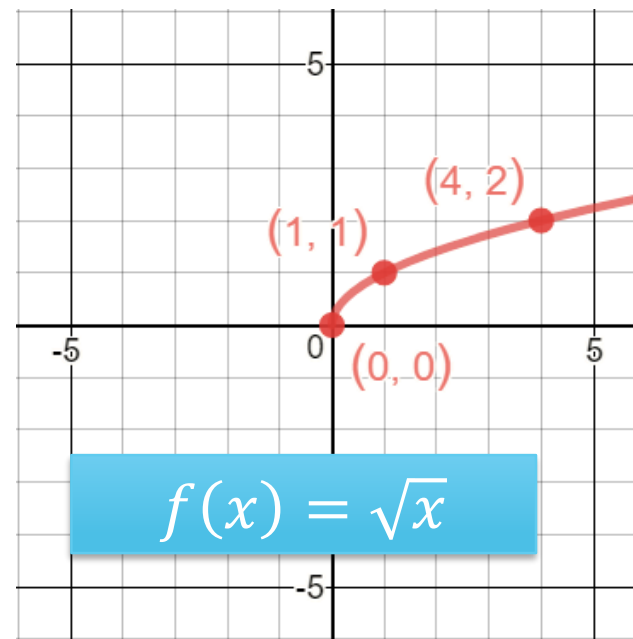
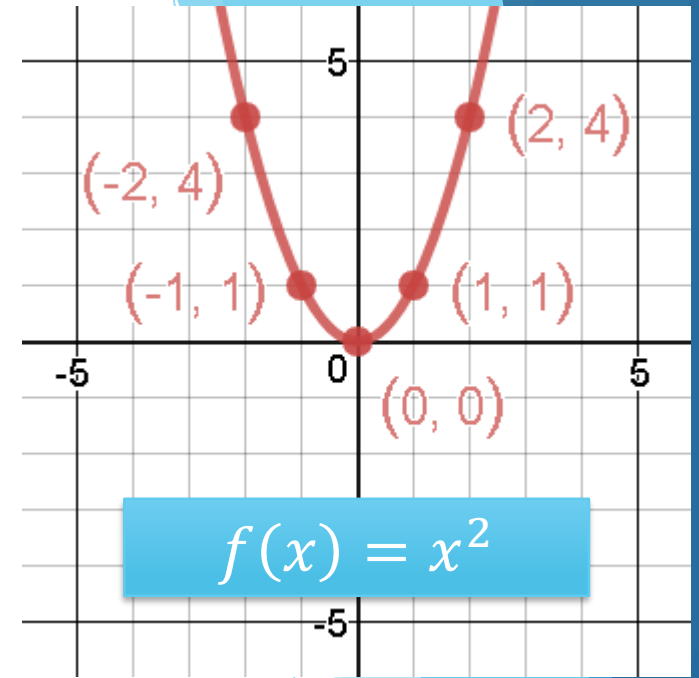
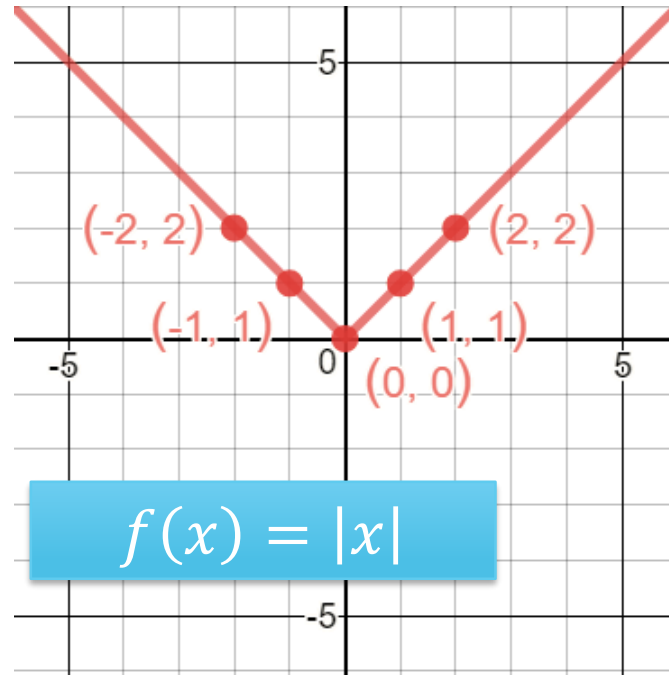
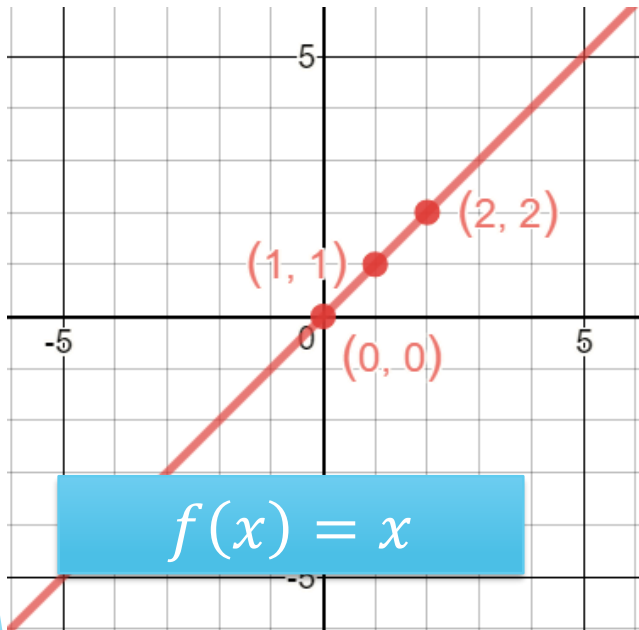
$x$	$f(x)$
-2	
-1	
0	
1	
2	
3	
4	

Domain:

Range:



# Four Basic Functions



You are expected to memorize these graphs.

Other basic functions include:

$$f(x) = \frac{1}{x}; f(x) = x^3; f(x) = \sqrt[3]{x}.$$