4.6: Graphing

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

Assignments

HW29

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.

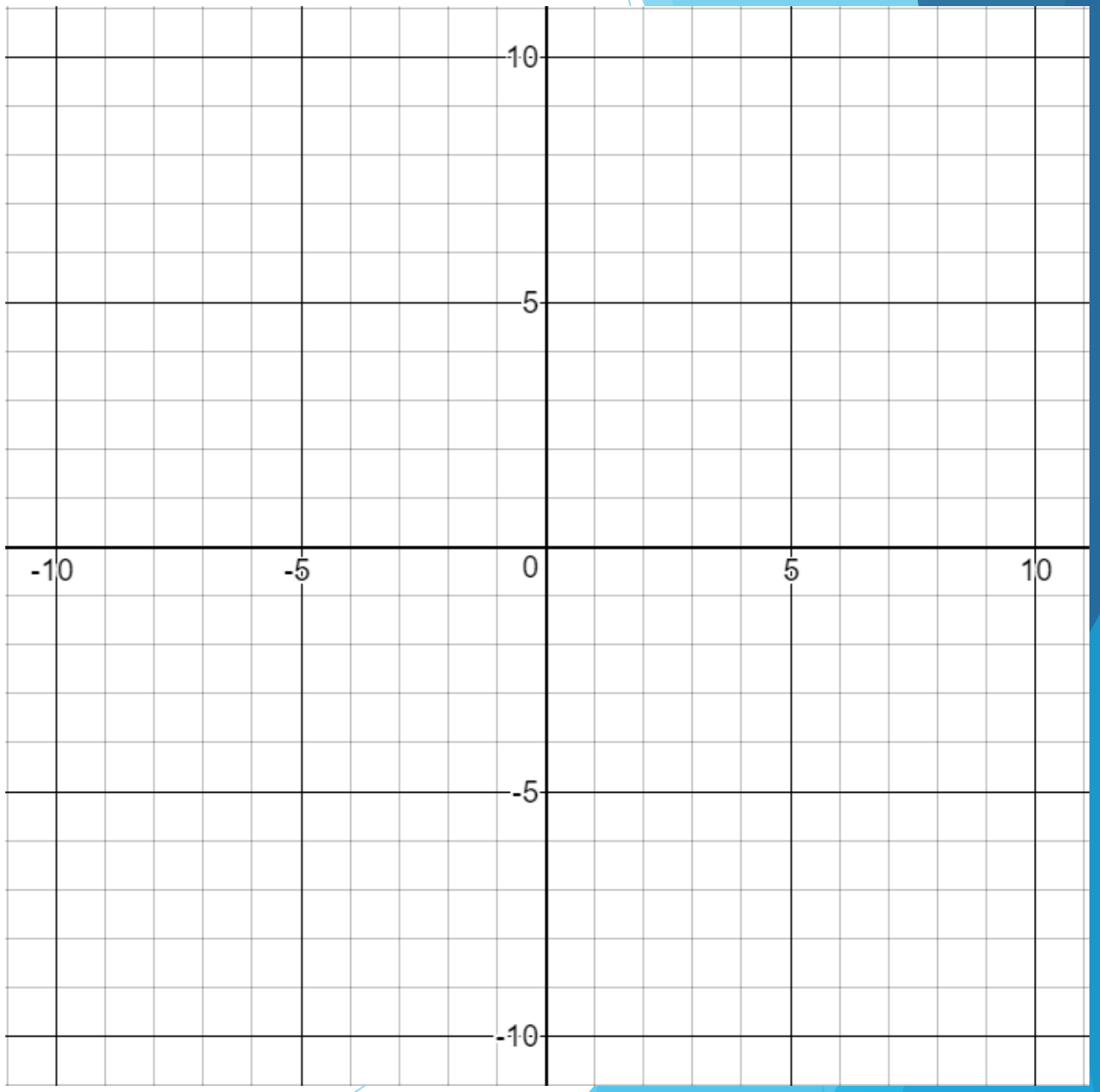
Linear Functions

1. $f(x) = x$

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

Domain:

Range:



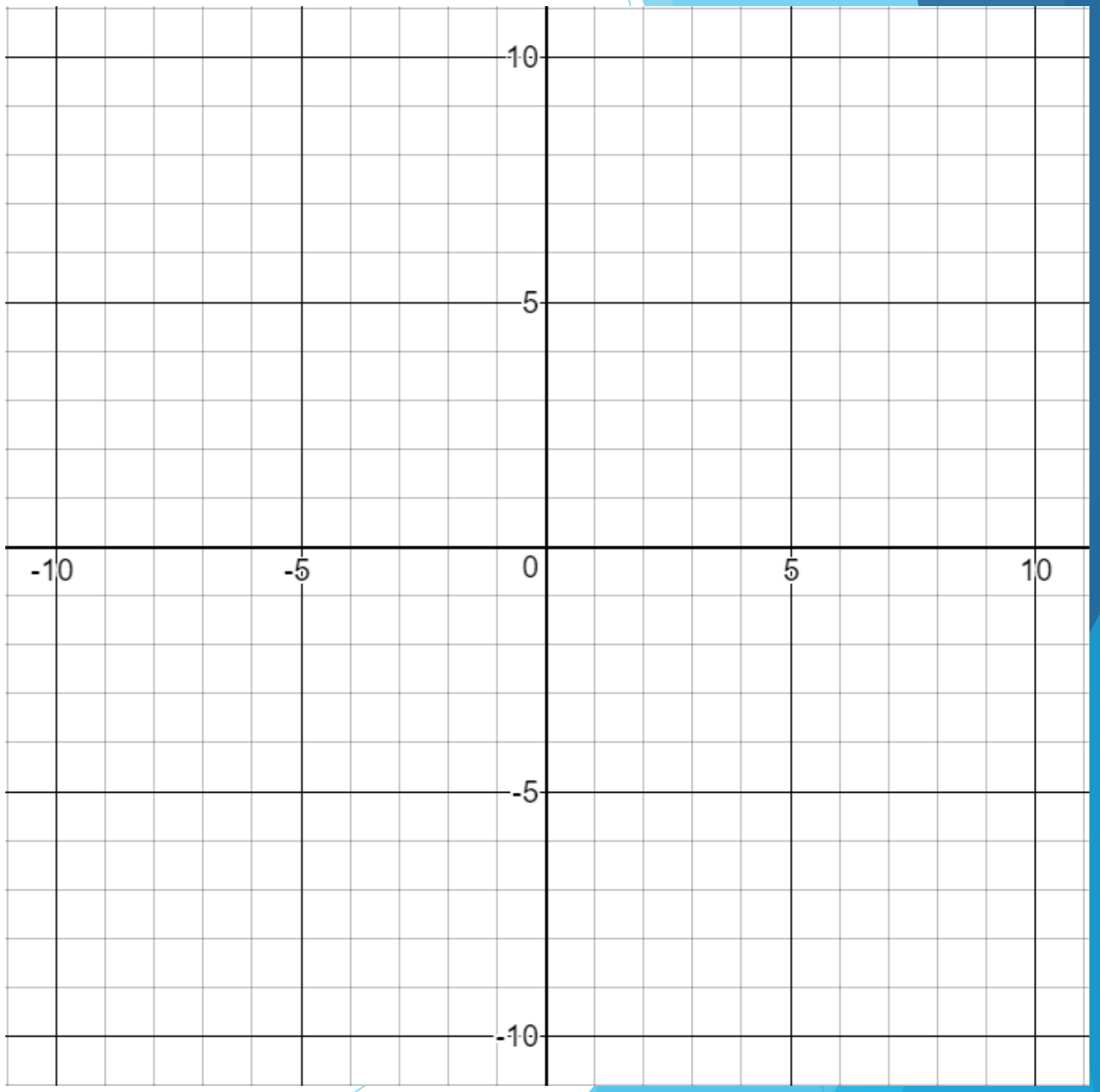
Absolute Value Functions

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

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

Domain:

Range:



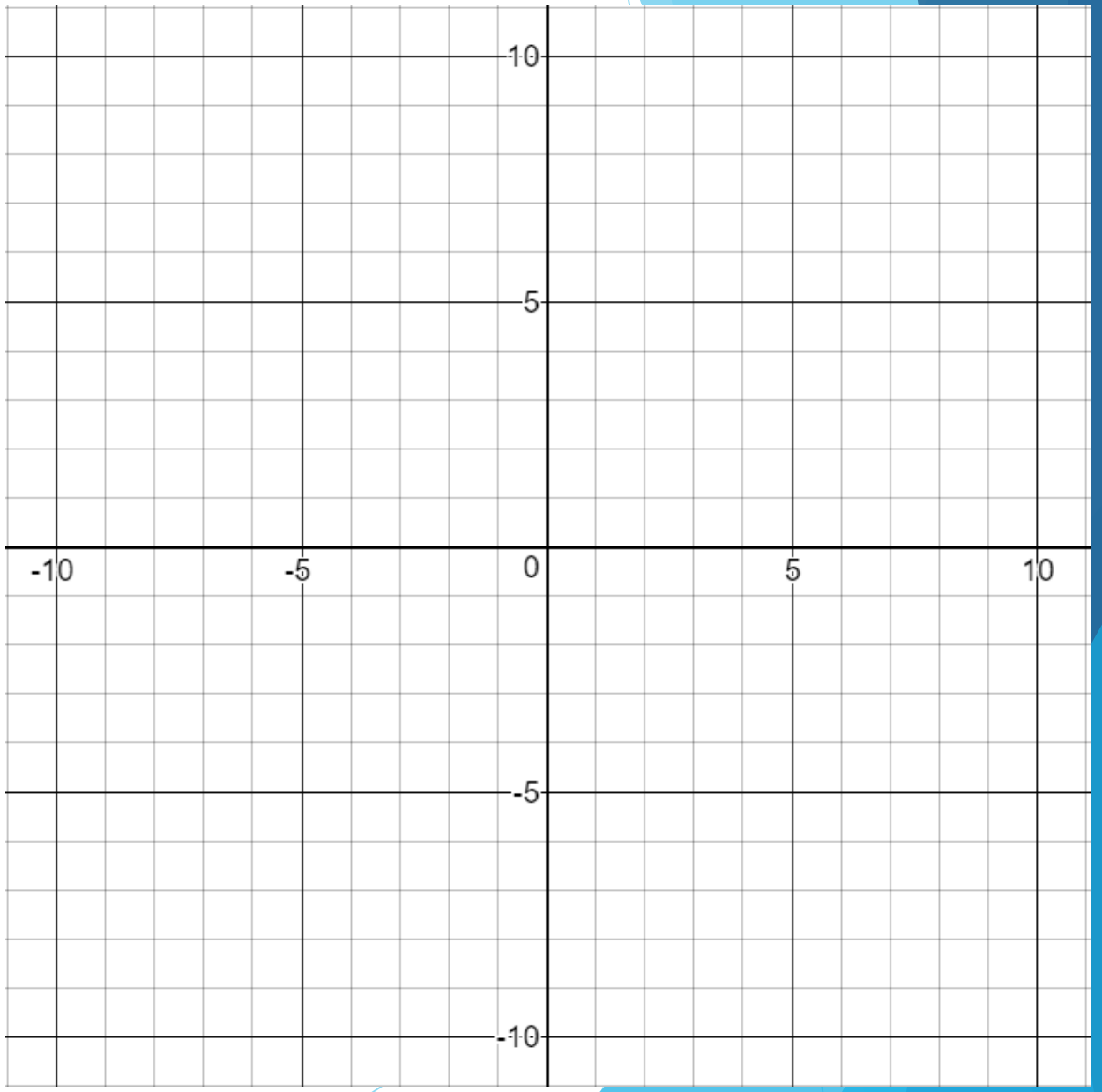
Quadratic Functions

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

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

Domain:

Range:



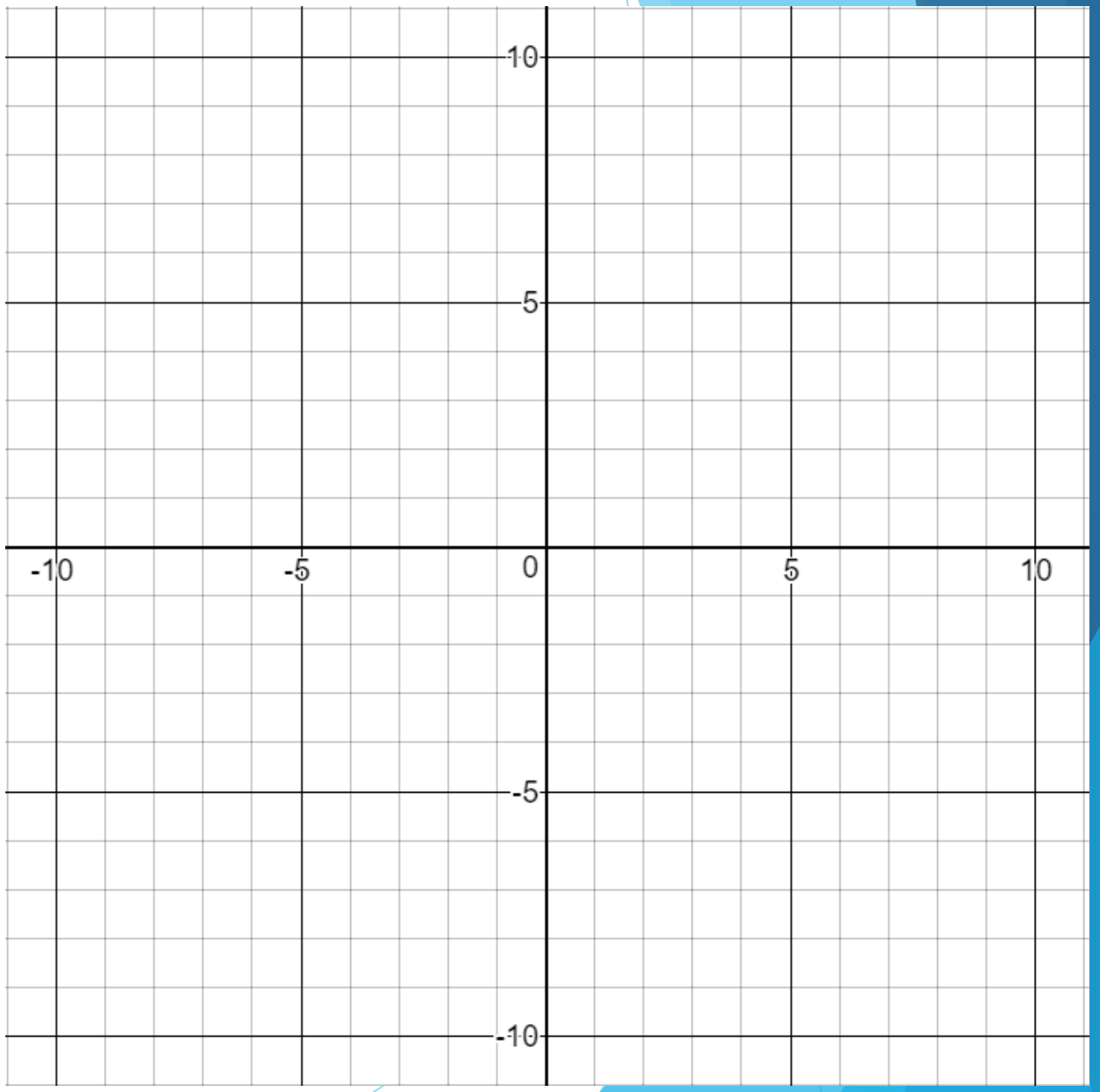
Square Root Functions

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

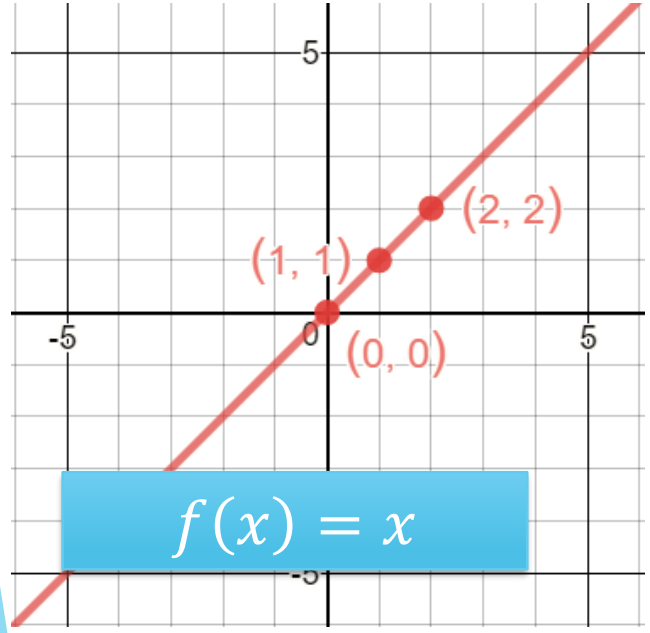
x	$f(x)$
-2	
-1	
0	
1	
2	
3	
4	

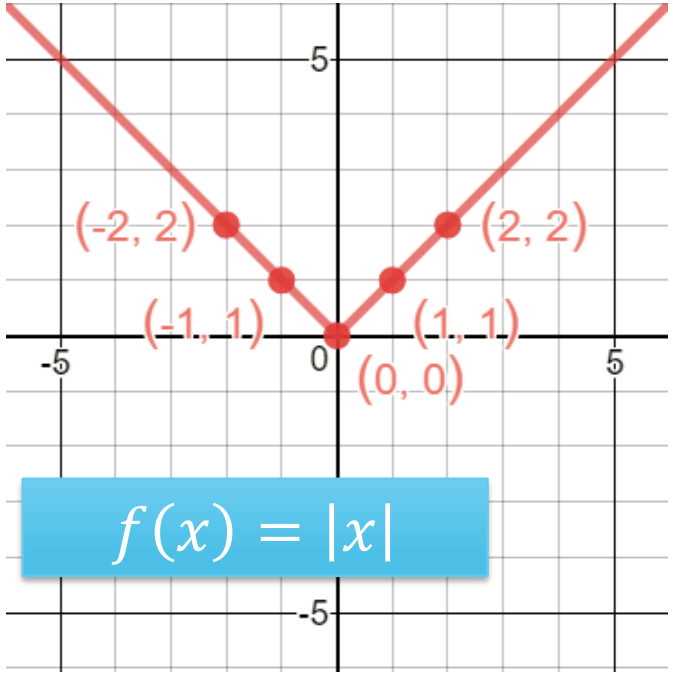
Domain:

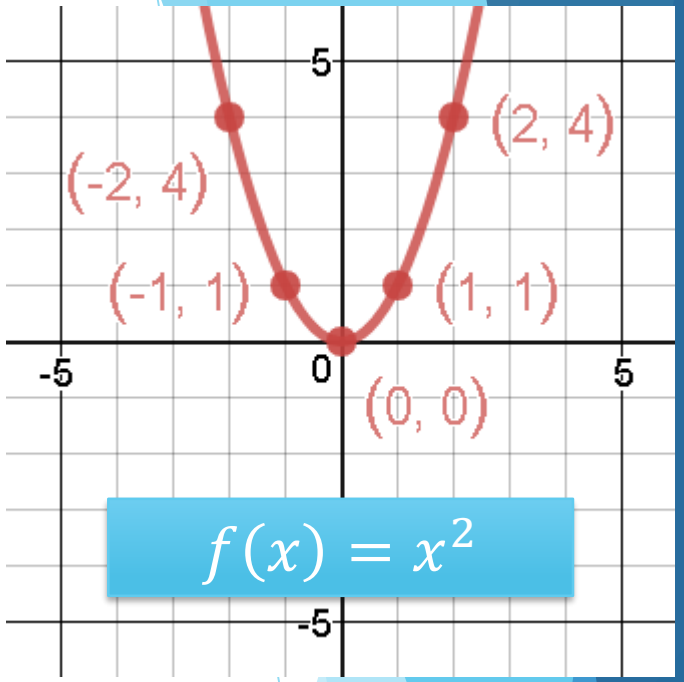
Range:

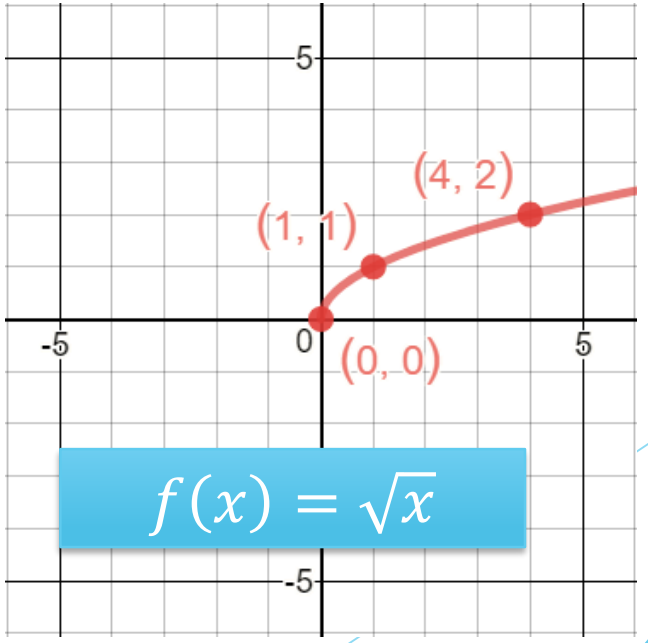


Four Basic Functions









You are expected to memorize these graphs.

Other basic functions include:

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

4.7 Vertical Shifts

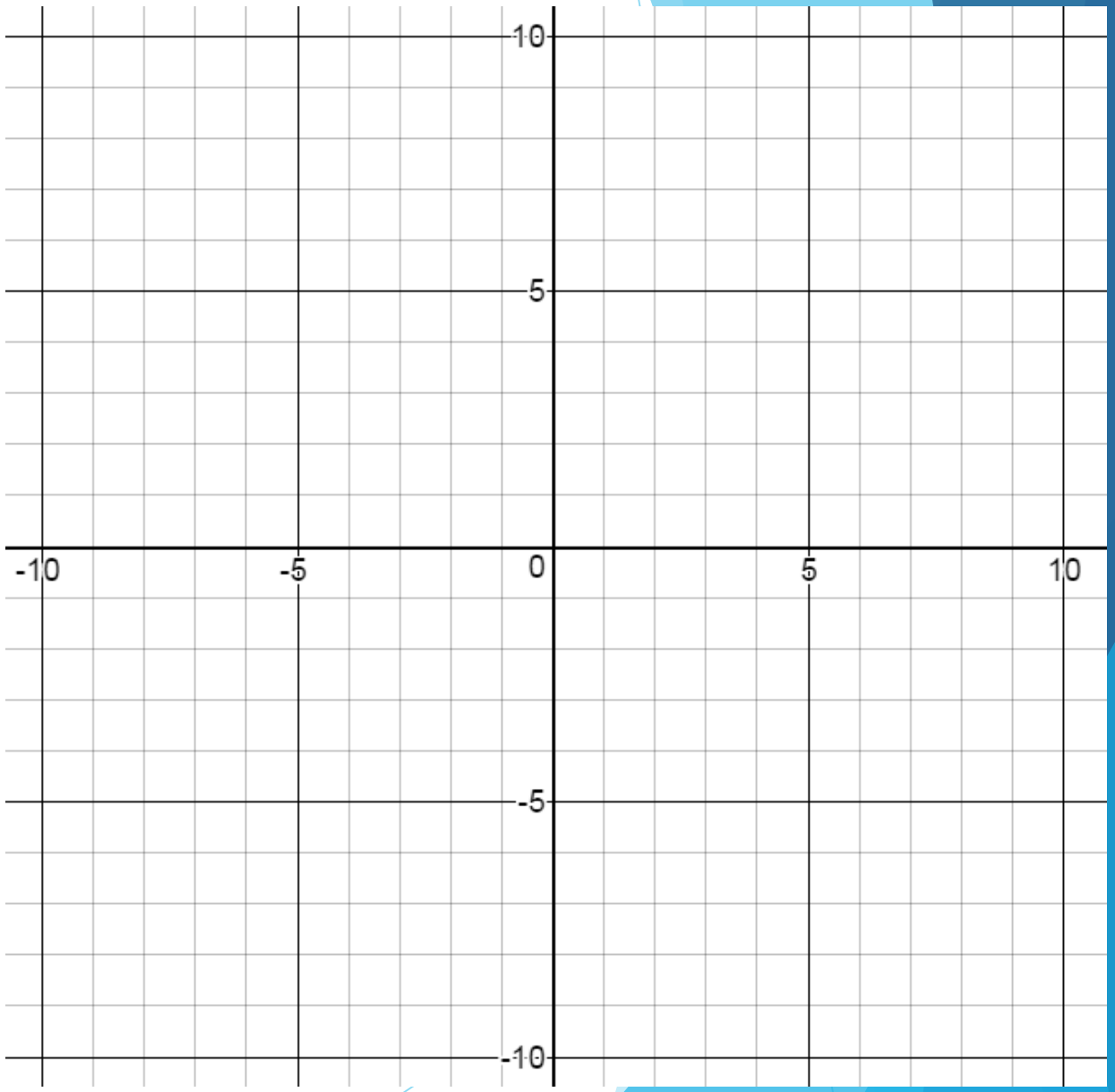
SWBAT identify vertical shifts and use them to graph a function.

- Create a table of values and graph the following functions.

1. $f(x) = |x|$
2. $g(x) = |x| + 2$
3. $h(x) = |x| + 4$

- What patterns do you see?

- When we _____ a _____ number to the _____, the graph _____.

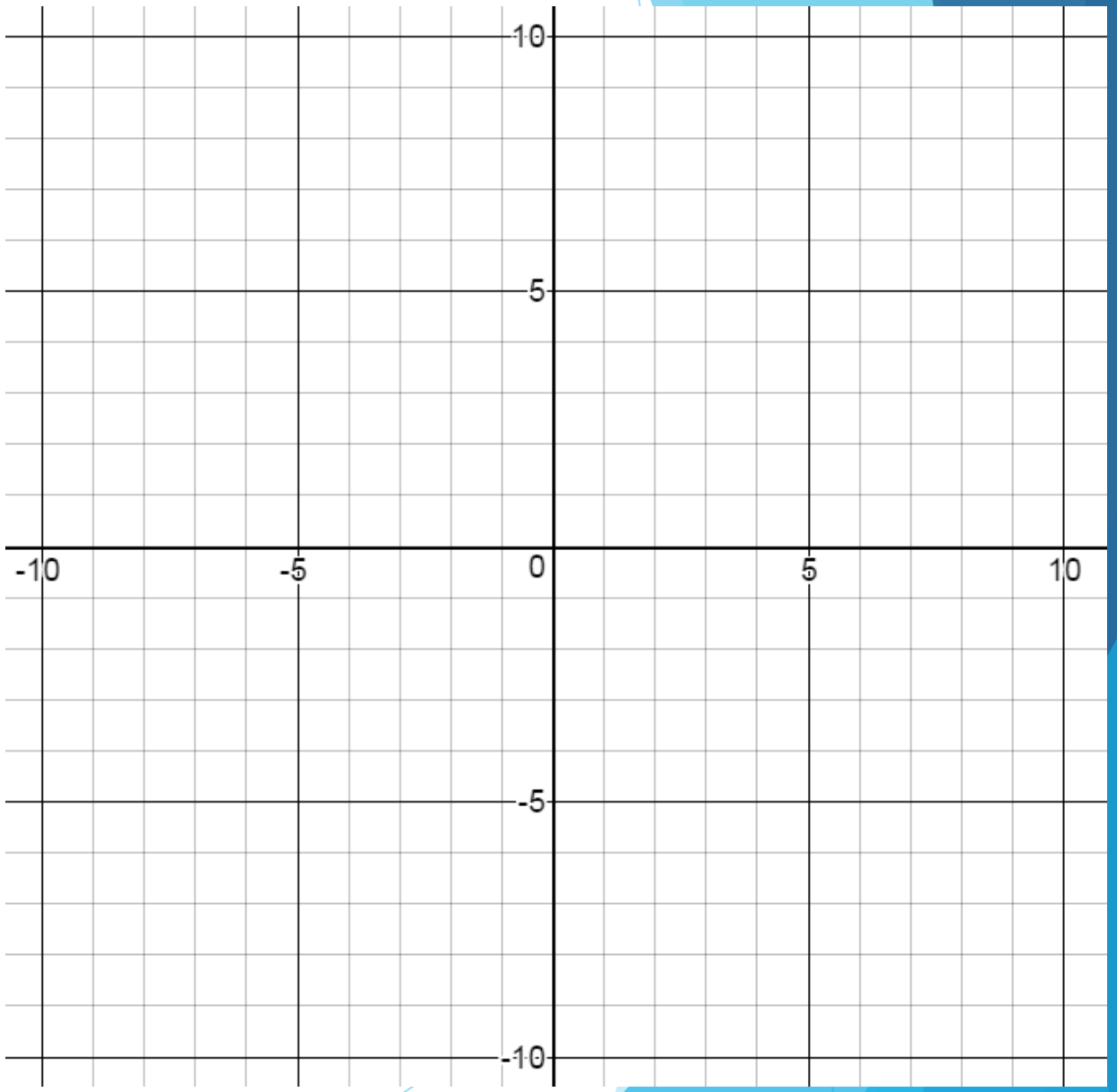


- Create a table of values and graph the following functions.

1. $f(x) = |x|$
2. $f(x) = |x| - 1$
3. $f(x) = |x| - 6$

- What patterns do you see?

- When we _____ a _____ number to the _____, the graph _____.



Vertical Shift

- $f(x) + k$

- Adding a number to the output of the function results in a *vertical shift*.

- The function that is being changed is called a *parent function*. The parent is always one of the basic functions.

- List the parent function and predict how the graph of the function will shift.
- $f(x) = |x| + 4$

1. $g(x) = |x| - 2$
2. $n(x) = x^2 + 4$
3. $b(x) = \sqrt{x} - 3$
4. $t(x) = \sqrt{x} + 10$

- List the parent function and predict how the graph of the function will shift. Then graph.
- $f(x) = |x| + 4$

1. $g(x) = |x| - 2$
2. $n(x) = x^2 + 4$
3. $b(x) = \sqrt{x} - 3$
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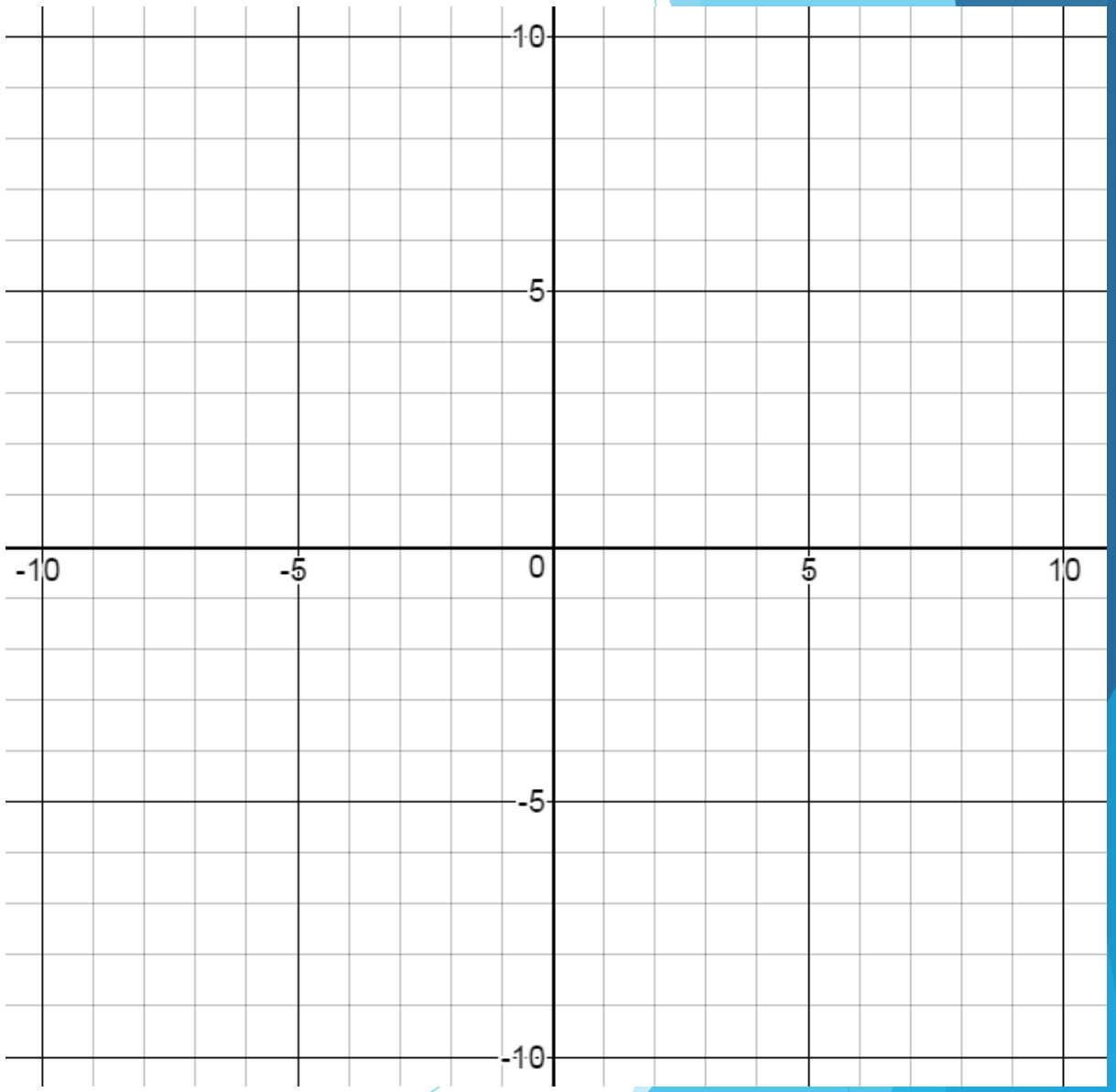

- List the parent function and predict how the graph of the function will shift. Then graph.
- $f(x) = |x|$

1. $f(x) + 3$
2. $f(x) - 4$
3. $f(x) + 5$
4. $f(x) - 2$
5. $f(x) - 1$