

Algebra RH

Essential Question: How do we graph absolute value and square root functions?

Do Now: Solve for x in each equation

1. $|2x + 1| = 9$

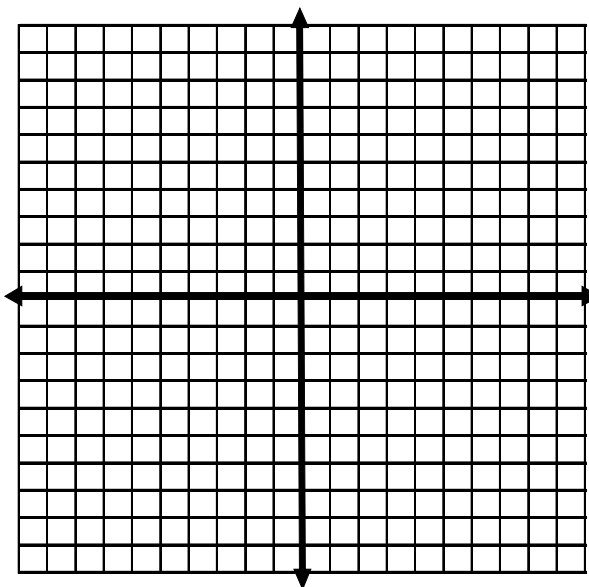
2. $3|x - 4| + 2 = 8$

3. $|4x - 7| = x + 2$

4. $-2|x| = 12$

Complete the table of values for the parent function, $f(x) = |x|$. ($|x|$ is found under the MATH Key: MATH \rightarrow NUM \rightarrow 1:abs) Use the table of values to complete the graph.

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



What is the minimum value of the function? _____

State the domain: _____ State the range: _____

State the domain over which the function is increasing: _____

We call this the **PARENT FUNCTION**

ABSOLUTE VALUE FUNCTIONS: One of the most recognized piecewise defined functions

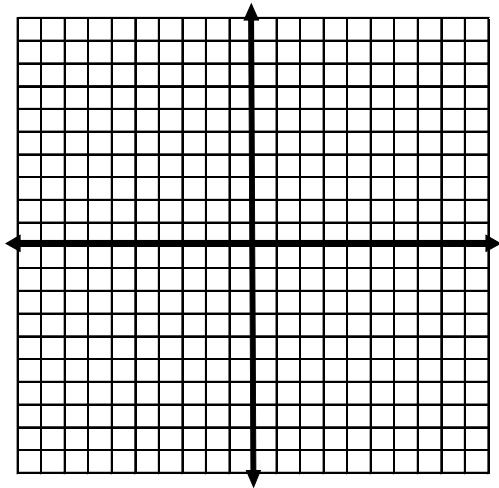
When finding the **range** of an absolute value function, find the vertex (the turning point).

- If the graph opens **upwards**, the range will be **greater than or equal** to the y-coordinate of the vertex.
- If the graph opens **downward**, the range will be **less than or equal** to the y-coordinate of the vertex.

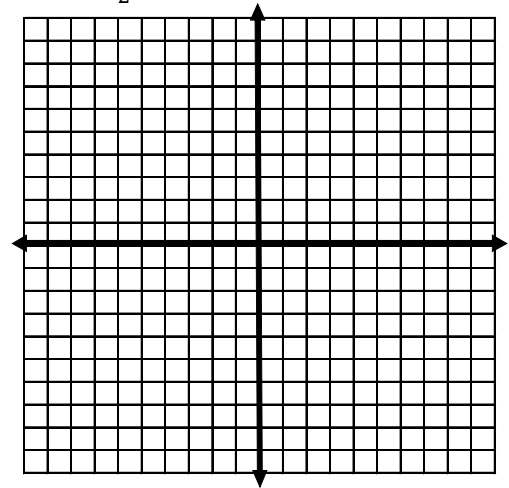
The **average rate of change** is **constant** on each straight line section (ray) of the graph.

Examples: Graph each absolute value function below. State the domain and range for each function.

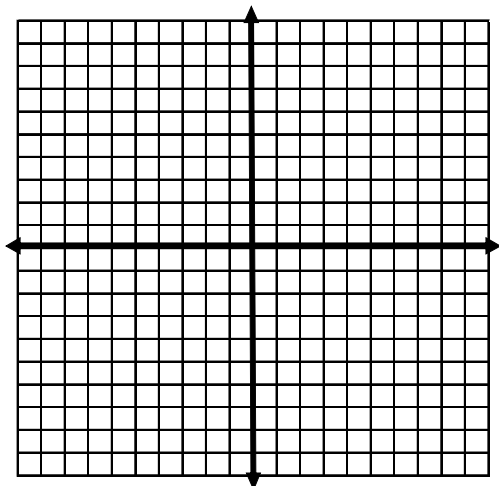
1) $y = 2|x|$



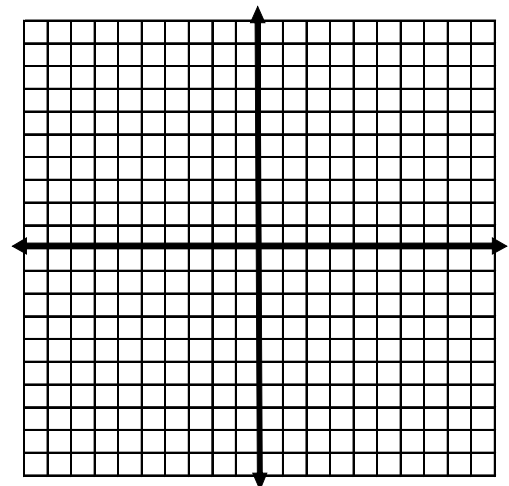
2) $y = \frac{1}{2}|x| + 3$



3) $y = -|x| - 2$



4) $y = -\frac{1}{4}|x - 1|$



A **radical equation** is an equation in which the variable is under the radical symbol (in the radicand).

$$\sqrt{x} + 3 = 10$$

is a radical equation

$$x + \sqrt{3} = 10$$

is **NOT** a radical equation

To solve radical equations:

1. Isolate the radical to one side of the equal sign.
2. If the radical is a square root, square each side of the equation.
3. Solve the resulting equation.

Examples:

1. $\sqrt{x} = 5$

2. $\sqrt{\frac{x}{2}} = 2$

3. $\sqrt{2x + 4} - 5 = 0$

4. $\sqrt{3x - 4} = \sqrt{2x - 6}$

GRAPHING SQUARE ROOT FUNCTIONS – AKA: RADICAL FUNCTIONS

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

- (a) Create a table of values for input values of x for which you can find rational square roots.

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

- (c) What is the domain of this function?

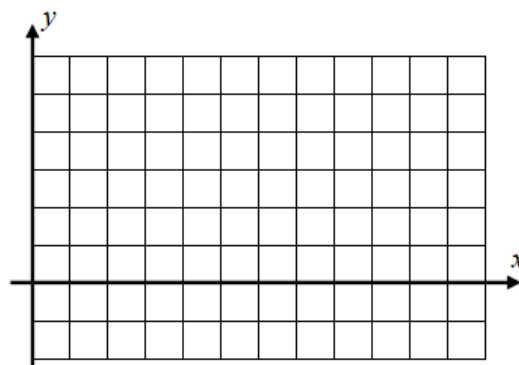
- (d) What is the range of this function?

- (e) Circle the correct choice below that characterizes $f(x) = \sqrt{x}$.

$f(x)$ is always decreasing

$f(x)$ is always increasing

- (b) Graph the function on the grid provided.

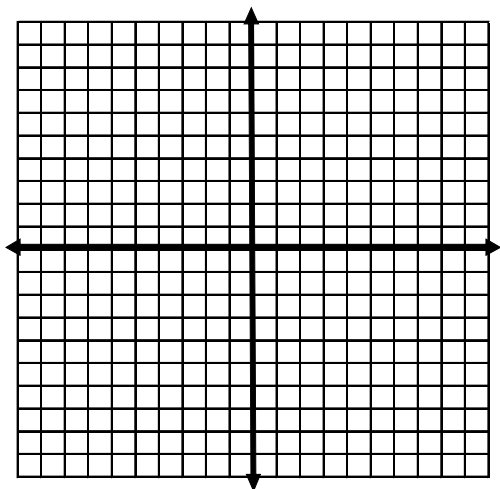


We call this the **PARENT FUNCTION**

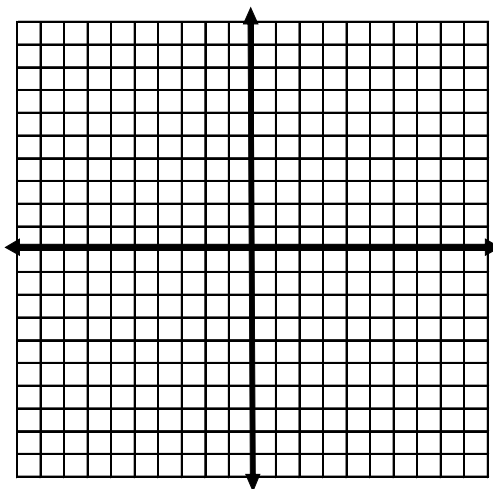
Examples: Graph each square root function below. State the domain and range for each function.

For the table of values, choose inputs that create a perfect square under the radical.

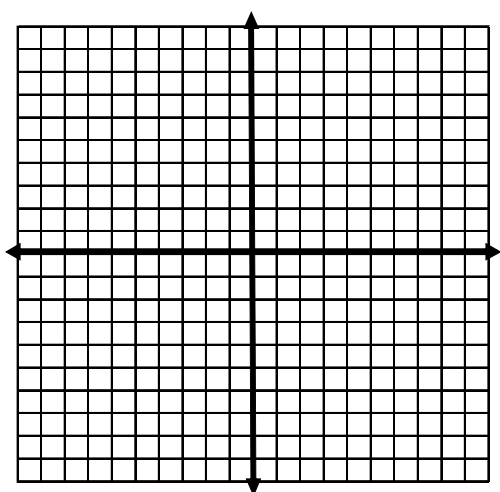
1) $y = \sqrt{x} + 2$



2) $y = \sqrt{x + 4}$



3) $y = -2\sqrt{x - 1}$



4) $y = -\frac{1}{3}\sqrt{x}$

