6.5 Part 2: Graphing Absolute Value Equations

The Parent Function for Absolute Value

To the left of $x = 0$, the graph is given by the line $y = -x$.

$(-2, 2)$ 2 $(2, 2)$

$(0, 0)$ 3

vertex

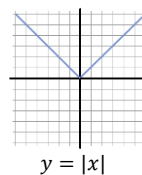To the right of $x = 0$, the graph is given by the line $y = x$.
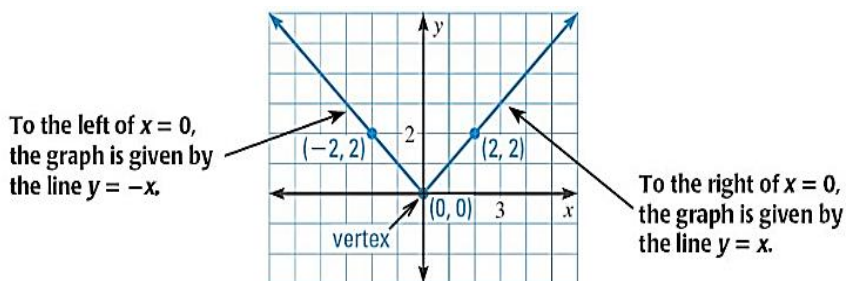
The parent function for all absolute value functions is

For every point (x, y) on the graph, the point $(-x, y)$ is also on the graph.

The **vertex** is the highest or lowest point on the graph, depending on if the graph is open upwards or downwards. It is where the two sides meet.

- V shape
- Symmetric about the y-axis

$y = |x|$

$y = -|x|$

How to find the vertex of an absolute value equation:

General form of an absolute value equation: $y = |x - h| + k$

<u>Vertex:</u>

Whatever sign h has in the equation, its sign in the vertex is the _____, while the sign

for k _____.

If there is no h or k value, we can assume that it is zero.

Examples:

$y = |x + 3| - 4$ vertex: $(-3, \ -4)$

$y = |x - 2| - 5$ vertex: $(2, \ -5)$

$y = |x + 5| + 1$ vertex: $(-5, \ 1)$

$y = |x - 7| + 2$ vertex: $(7, \ 2)$

Examples- Find the vertex of each absolute value equation.

a.)   b.)   c.)   d.)   e.)

Steps to Graph an Absolute Value Equation:

Let's complete some examples on graph paper!