

# The Absolute Value Parent Function

An **absolute value** function is a function that contains an algebraic expression within absolute value symbols. Recall that the absolute value of a number is its distance from **0** on the **number line**.

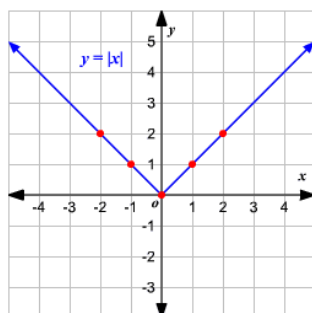
The absolute value parent function, written as  $f(x) = |x|$ , is defined as

$$f(x) = \begin{cases} x & \text{if } x > 0 \\ 0 & \text{if } x = 0 \\ -x & \text{if } x < 0 \end{cases}$$

To graph an absolute value function, choose several values of  $x$  and find some **ordered pairs**.

$x$	$y =  x $
-2	2
-1	1
0	0
1	1
2	2

Plot the points on a coordinate plane and connect them.



Observe that the graph is V-shaped.

- (1) The vertex of the graph is  $(0, 0)$ .
- (2) The **axis of symmetry** ( $x = 0$  or **y-axis**) is the line that divides the graph into two congruent halves.
- (3) The domain is the set of all real numbers.
- (4) The range is the set of all real numbers greater than or equal to **0**. That is,  $y \geq 0$ .
- (5) The **x-intercept** and the **y-intercept** are both **0**.