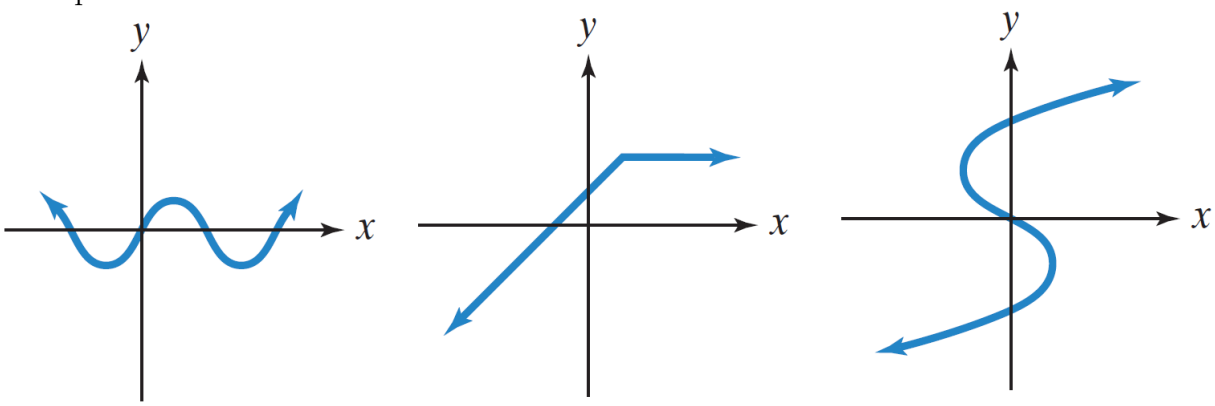
In Algebra 1, we graphed linear equations - equations in the form of $y = mx + b$ - by using the slope and the y-intercept. We also graphed quadratic equations by making a table of values. When we graph *functions*, we use the same process.

We are able to determine if a graph is the graph of a function if it passes the *vertical line test*.

Definition 8.2.1 (Vertical Line Test)**.** If any vertical line intersects a graph in more than one point, the graph does not represent y as a function of x ($y(x)$).

Example 8.2.1. Use the vertical line test to determine whether or not each of the following graphs represents a function.



Interval Notation

An *interval* of numbers is a portion of the number line between some two values. We can represent an interval in *set-builder notation*, *inequality notation* and as a graph on a number line. Remember that with intervals, parentheses, (), show that a value is not included and that square brackets, [], show that values are included.

Interval Notation	**Set-Builder Notation**	**Graph**
(a, b)		
$[a, b]$		
$[a, b)$		
$(a, b]$		
(a, ∞)		
$[a, \infty)$		
$(-\infty, b)$		
$(-\infty, b]$		
$(-\infty, \infty)$		

Example 8.2.2. Give each interval in set-builder notation and as a graph.

1. $[-2, 5)$

2. $[1, 3.5]$

3. $(-\infty, -1)$

Identifying Domain & Range from a Graph

For a given graph, we can determine the domain and range by looking at how far the graph extends along both the x and y axes. Recall that domain corresponds to the x values and range to the y values.

Example 8.2.3. Identify the domain and range for each of the functions below.