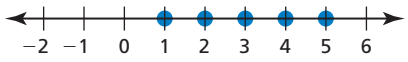
Name _____ Date _____

Graphing Linear Functions

A **linear function** is a function whose graph is a nonvertical line. A linear function can be represented by a linear equation in two variables, $y = mx + b$, where m is the slope and b is the y-intercept. A **solution of a linear equation in two variables** is an ordered pair (x, y) that makes the equation true. The graph of a linear equation in two variables is the set of points (x, y) in a coordinate plane that represents all solutions of the equation. The points may be distinct or connected.

Discrete Domain	Continuous Domain
A **discrete domain** is a set of input values that consists of only certain numbers in an interval. **Example:** Integers from 1 to 5 	A **continuous domain** is a set of input values that consists of all numbers in an interval. **Example:** All numbers from 1 to 5 

Example 1 **The linear function $y = 29.8x$ represents the number y of kilometers Earth travels in orbit around the Sun in x seconds. (a) Find the domain of the function. Is the domain discrete or continuous? Explain. (b) Graph the function using its domain.**

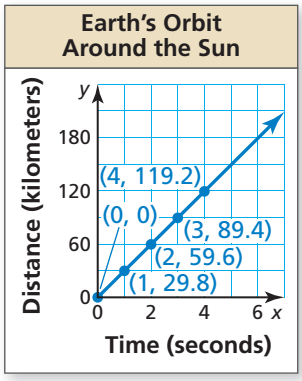
a. Earth can travel in orbit for part of a second. The number x of seconds Earth travels in orbit can be any value greater than or equal to 0.

▶ So, the domain is $x \geq 0$, and it is continuous.

b. Make an input-output table to find ordered pairs.

x	0	1	2	3	4
$y = 29.8x$	0	29.8	59.6	89.4	119.2

Plot the ordered pairs. Draw a line through the points starting at (0, 0). Use an arrow to indicate that the line continues without end.



Practice

Check your answers at BigIdeasMath.com.

Copy and complete the table.

1.

x	−2	−1	0	1	2
$y = x + 2$	0	1	2	3	4

2.

x	−2	−1	0	1	2
$y = x - 7$	−9	−8	−7	−6	−5

3. **BOATING** A speed boat tour costs \$60 per ticket. There are 5 tickets left. The total cost y of the tickets is a function of the number t of tickets you buy.

a. Find the domain of the function. Is the domain discrete or continuous? Explain.
0, 1, 2, 3, 4, 5; discrete; You can only buy whole numbers of tickets.

b. Graph the function using its domain.