

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
<p>A discrete domain is a set of input values that consists of only certain numbers in an interval.</p> <p>Example: Integers from 1 to 5</p> 	<p>A continuous domain is a set of input values that consists of all numbers in an interval.</p> <p>Example: All numbers from 1 to 5</p> 

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.

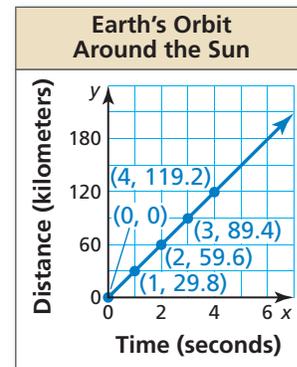
a. Earth can travel in orbit for part of a second. The number x of seconds Earth travels in orbit can be any value greater than or equal to 0.

► 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.

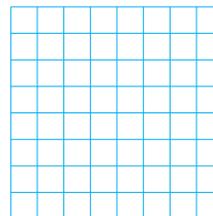
x	-2	-1	0	1	2
$y = x + 2$					

2.

x	-2	-1	0	1	2
$y = x - 7$					

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.



b. Graph the function using its domain.