Use Discrete and Continuous Functions **TEKS** *2A.1.A*

GOAL Graph and classify discrete and continuous functions.

Key Vocabulary
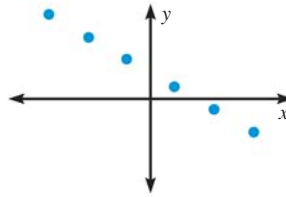• discrete function
• continuous function

The graph of a function may consist of *discrete*, or separate and unconnected, points in a plane. The graph of a function may also be a *continuous*, or unbroken, line or curve or part of a line or curve.

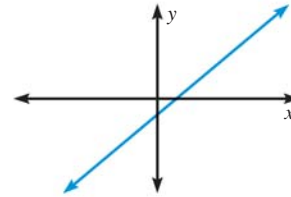**KEY CONCEPT**   *For Your Notebook*

Discrete and Continuous Functions

The graph of a **discrete function** consists of separate points.

The graph of a **continuous function** is unbroken.

EXAMPLE 1   **Graph and classify functions**

Graph the function $f(x) = 0.5x + 1$ for the given domain. Classify the function as *discrete* or *continuous* for the domain. Then identify the range.
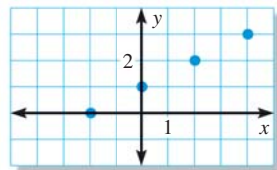
a. Domain: $x = -2, 0, 2, 4$
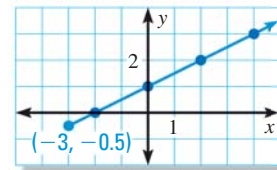
b. Domain: $x \geq -3$

Solution

a. Make a table using the x-values in the domain.

x	−2	0	2	4
y	0	1	2	3

The graph consists of separate points, so the function is discrete. Its range is 0, 1, 2, 3.

b. Note that $f(x)$ is a linear function defined for $x \geq -3$, and that $f(-3) = -0.5$. So, the graph is the ray with endpoint $(-3, -0.5)$ that passes through all the points from the table in part (a).

The graph is unbroken, so the function is continuous. Its range is $y \geq -0.5$.