Sometimes the set of points that represent the solutions of an equation are distinct, and other times the points are connected.

**Discrete and Continuous Domains**

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**

**Identifying Discrete and Continuous Domains**

For each situation, identify the independent and dependent variables. Then find the domain of the function and determine whether it is discrete or continuous.

**a.** The function \( C = 29.95t \) represents the total cost \( C \) (in dollars) of \( t \) tickets for a concert. Each fan can buy a maximum of six tickets.

**b.** The function \( y = -0.01x^2 + 4x \) represents the path of a soccer ball, where \( x \) is the horizontal distance (in yards) and \( y \) is the corresponding height (in yards).

**SOLUTION**

**a.** The total cost \( C \) of the tickets depends on the number \( t \) of tickets you buy. So, \( C \) is the dependent variable, and \( t \) is the independent variable.

You cannot buy part of a ticket, only a certain number of tickets. Because \( t \) represents the number of tickets, it must be a whole number. The maximum number of tickets a customer can buy is six.

So, the domain is 0, 1, 2, 3, 4, 5, and 6, and it is discrete.

**b.** The variable \( y \) is the dependent variable, and \( x \) is the independent variable.

The \( x \)-intercepts of the graph of \( y = -0.01x^2 + 4x \) are (0, 0) and (40, 0). The horizontal distance can be any number greater than or equal to 0 and less than or equal to 40.

So, the domain is \( 0 \leq x \leq 40 \), and it is continuous.

**Exercises Within Reach®**

**Identifying Discrete and Continuous Domains** In Exercises 1 and 2, identify the independent and dependent variables. Then find the domain of the function and determine whether it is discrete or continuous.

1. You are pumping water out of a flooded basement. The function \( A = 6575 - 50m \) represents the amount \( A \) (in gallons) of water remaining in the basement after \( m \) minutes.

2. You are reserving hotel rooms for a basketball team. The function \( C = 95r \) represents the total cost \( C \) (in dollars) of reserving \( r \) rooms for one night.