Name_____ Date_____

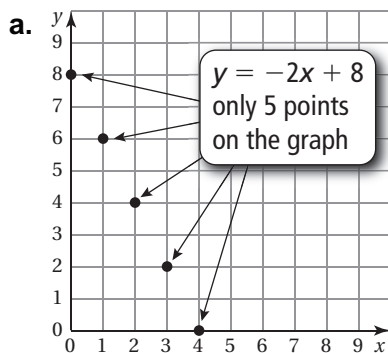## 4.2 Discrete and Continuous Domains
For use with Activity 4.2

Essential Question How can you decide whether the domain of a function is discrete or continuous?

---

1 **EXAMPLE:** Discrete and Continuous Domains

In Activities 1 and 2 in Section 2.4, you studied two real-life problems represented by the same equation.

$$4x + 2y = 16 \text{ or } y = -2x + 8$$

a.

$y = -2x + 8$
only 5 points on the graph

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Domain (x-values): 0, 1, 2, 3, 4
Range (y-values): 8, 6, 4, 2, 0
The domain is **discrete** because it consists of only the numbers 0, 1, 2, 3, and 4.

b.

$y = -2x + 8$
all points on line segment

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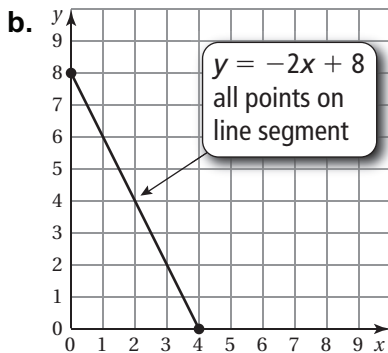
Domain (x-values): $x \geq 0$ and $x \leq 4$
(All numbers from 0 to 4)
Range (y-values): $y \geq 0$ and $y \leq 8$
(All numbers from 0 to 8)
The domain is **continuous** because it consists of all numbers from 0 and 4 on the number line.

Name _____ Date _____

2 **ACTIVITY:** Discrete and Continuous Domains

Work with a partner.

- **Write a function to represent each problem.**

- **Graph each function.**

- **Describe the domain and range of each function. Is the domain discrete or continuous?**

a. You are in charge of reserving hotel rooms for a youth soccer team. Each room costs $69, plus $6 tax, per night. You need each room for two nights. You need 10 to 16 rooms. Write a function for the total hotel cost.

b. The airline you are using for the soccer trip needs an estimate of the total weight of the team's luggage. You determine that there will be 36 pieces of luggage and each piece will weigh from 25 to 45 pounds. Write a function for the total weight of the luggage.

Hotel Reservations

Luggage Weight
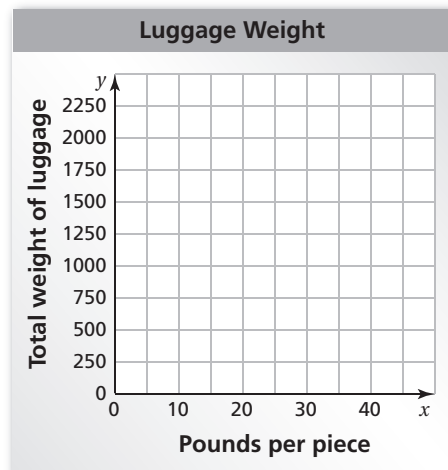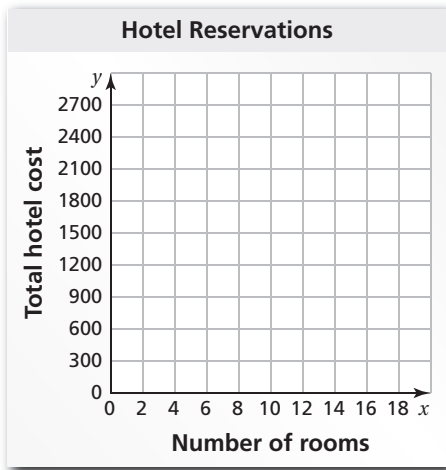
4.2 **Discrete and Continuous Domains** (continued)

What Is Your Answer?

3. **IN YOUR OWN WORDS** How can you decide whether the domain of a function is discrete or continuous? Describe two real-life examples of functions: one with a discrete domain and one with a continuous domain.
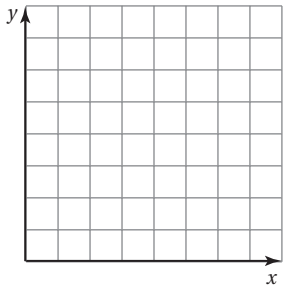
Name _____ Date _____

4.2 **Practice**
For use after Lesson 4.2

Graph the function. Is the domain discrete or continuous?

1.

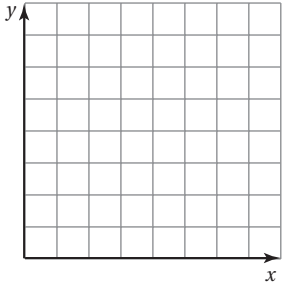| Input Length, x (inches)	Output Area, y (square inches)
2	12
4	24
6	36

2.

Input Shirts, x	Output Cost, y (dollars)
0	0
1	9.25
2	18.50
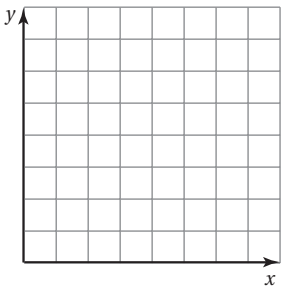
3. The function $c = 20 + 10m$ represents the amount of calories you burn after m minutes of exercising. Graph the function using a domain of 0, 5, 10, and 15. Is the domain discrete or continuous?

4. You buy cards to send to family and friends for their birthdays. The function $y = 2.5x$ represents the cost y of the number of cards x you buy.

   a. Is 8 in the domain? Explain.

   b. Is 40 in the range? Explain.