4-2 Exercises

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GUIDED PRACTICE

Vocabulary Apply the vocabulary from this lesson to answer each question.

1. Use a mapping diagram to show a relation that is not a *function*.
2. The set of x-values for a relation is also called the ___?___. (*domain* or *range*)

SEE EXAMPLE 1 p. 236

Express each relation as a table, as a graph, and as a mapping diagram.

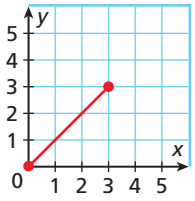
3. $\{(1, 1), (1, 2)\}$
4. $\left\{(-1, 1), \left(-2, \frac{1}{2}\right), \left(-3, \frac{1}{3}\right), \left(-4, \frac{1}{4}\right)\right\}$
5. $\{(-1, 1), (-3, 3), (5, -5), (-7, 7)\}$
6. $\{(0, 0), (2, -4), (2, -2)\}$

SEE EXAMPLE 2 p. 237

Give the domain and range of each relation.

7. $\{(-5, 7), (0, 0), (2, -8), (5, -20)\}$
8. $\{(1, 2), (2, 4), (3, 6), (4, 8), (5, 10)\}$
9.

x	3	5	2	8	6
y	9	25	4	81	36

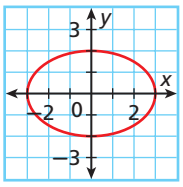
10. 

SEE EXAMPLE 3 p. 237

Multi-Step Give the domain and range of each relation. Tell whether the relation is a function. Explain.

11. $\{(1, 3), (1, 0), (1, -2), (1, 8)\}$
12. $\{(-2, 1), (-1, 2), (0, 3), (1, 4)\}$
13.

x	−2	−1	0	1	2
y	1	1	1	1	1

14. 

PRACTICE AND PROBLEM SOLVING

Independent Practice

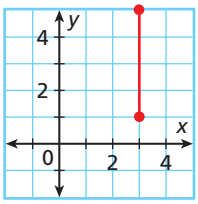
For Exercises	See Example
15–16	1
17–18	2
19–20	3

Extra Practice
Skills Practice p. S10
Application Practice p. S31

Express each relation as a table, as a graph, and as a mapping diagram.

15. $\{(-2, -4), (-1, -1), (0, 0), (1, -1), (2, -4)\}$
16. $\left\{(2, 1), \left(2, \frac{1}{2}\right), (2, 2), \left(2, 2\frac{1}{2}\right)\right\}$

Give the domain and range of each relation.

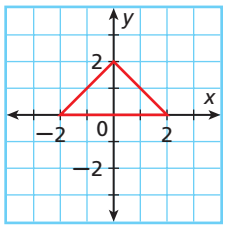
17. 

18.

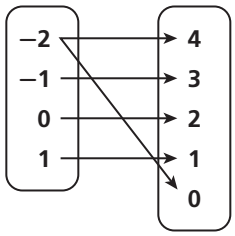
x	y
4	4
5	5
6	6
7	7
8	8

Multi-Step Give the domain and range of each relation. Tell whether the relation is a function. Explain.

19.



20.



21. **Consumer Application** An electrician charges a base fee of $75 plus $50 for each hour of work. Create a table that shows the amount the electrician charges for 1, 2, 3, and 4 hours of work. Let x represent the number of hours and y represent the amount charged for x hours. Is this relation a function? Explain.

22. **Geometry** Write a relation as a set of ordered pairs in which the x-value represents the length of a side of a square and the y-value represents the area of the square. Use a domain of 2, 4, 6, 9, and 11.

23. **Multi-Step** Create a mapping diagram to display the numbers of days in 1, 2, 3, and 4 weeks. Is this relation a function? Explain.

24. **Nutrition** The illustrations list the number of grams of fat and the number of Calories from fat for selected foods.

a. Create a graph for the relation between grams of fat and Calories from fat.

b. Is this relation a function? Explain.

Hamburger
Fat (g): 14
Fat (Cal): 126

Cheeseburger
Fat (g): 18
Fat (Cal): 162

Grilled chicken filet
Fat (g): 3.5
Fat (Cal): 31.5

Breaded chicken filet
Fat (g): 11
Fat (Cal): 99

Taco salad
Fat (g): 19
Fat (Cal): 171

25. **Recreation** A shop rents canoes for a $7 equipment fee and $2 per hour, with a maximum cost of $15 per day. Express the number of hours x and the cost y as a relation in table form, and find the cost to rent a canoe for 1, 2, 3, 4, and 5 hours. Is this relation a function? Explain.

26. **Health** You can burn about 6 Calories a minute bicycling. Let x represent the number of minutes bicycled, and let y represent the number of Calories burned.

a. Write ordered pairs to show the number of Calories burned if you bicycle for 60, 120, 180, 240, or 300 minutes. Graph the ordered pairs.

b. Find the domain and range of the relation.

c. Does this graph represent a function? Explain.

27. **Critical Thinking** For a function, can the number of elements in the range be greater than the number of elements in the domain? Explain.

28. **Critical Thinking** Tell whether each statement is true or false. If false, explain why.

a. All relations are functions.

b. All functions are relations.