

GUIDED PRACTICE

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

- The output of a function is the ___?___ variable. (*independent* or *dependent*)
- An algebraic expression that defines a function is a ___?___. (*function rule* or *function notation*)

SEE EXAMPLE 1

p. 245

Determine a relationship between the x - and y -values. Write an equation.

x	1	2	3	4
y	-1	0	1	2

3.

x	1	2	3	4
y	-1	0	1	2
4. $\{(1, 4), (2, 7), (3, 10), (4, 13)\}$

SEE EXAMPLE 2

p. 246

Identify the independent and dependent variables in each situation.

- A small-size bottle of water costs \$1.99 and a large-size bottle of water costs \$3.49.
- An employee receives 2 vacation days for every month worked.

SEE EXAMPLE 3

p. 246

Identify the independent and dependent variables. Write a rule in function notation for each situation.

- An air-conditioning technician charges customers \$75 per hour.
- An ice rink charges \$3.50 for skates and \$1.25 per hour.

SEE EXAMPLE 4

p. 247

Evaluate each function for the given input values.

- For $f(x) = 7x + 2$, find $f(x)$ when $x = 0$ and when $x = 1$.
- For $g(x) = 4x - 9$, find $g(x)$ when $x = 3$ and when $x = 5$.
- For $h(t) = \frac{1}{3}t - 10$, find $h(t)$ when $t = 27$ and when $t = -15$.

SEE EXAMPLE 5

p. 248

12. A construction company uses beams that are 2, 3, or 4 meters long. The measure of each beam must be converted to centimeters. Write a function rule to describe the situation. Find a reasonable domain and range for the function. (*Hint*: 1 m = 100 cm)

PRACTICE AND PROBLEM SOLVING

Independent Practice

For Exercises	See Example
13–14	1
15–16	2
17–19	3
20–22	4
23	5

Determine a relationship between the x - and y -values. Write an equation.

13.

x	1	2	3	4
y	-2	-4	-6	-8

14. $\{(1, -1), (2, -2), (3, -3), (4, -4)\}$

Identify the independent and dependent variables in each situation.

- Gardeners buy fertilizer according to the size of a lawn.
- The cost to gift wrap an order is \$3 plus \$1 per item wrapped.

Identify the independent and dependent variables. Write a rule in function notation for each situation.

- To rent a DVD, a customer must pay \$3.99 plus \$0.99 for every day that it is late.
- Stephen charges \$25 for each lawn he mows.
- A car can travel 28 miles per gallon of gas.

Extra Practice

Skills Practice p. S10
 Application Practice p. S31

Evaluate each function for the given input values.

20. For $f(x) = x^2 - 5$, find $f(x)$ when $x = 0$ and when $x = 3$.

21. For $g(x) = x^2 + 6$, find $g(x)$ when $x = 1$ and when $x = 2$.

22. For $f(x) = \frac{2}{3}x + 3$, find $f(x)$ when $x = 9$ and when $x = -3$.

23. A mail-order company charges \$5 per order plus \$2 per item in the order, up to a maximum of 4 items. Write a function rule to describe the situation. Find a reasonable domain and range for the function.

24. **Transportation** Air Force One can travel 630 miles per hour. Let h be the number of hours traveled. The function rule $d = 630h$ gives the distance d in miles that Air Force One travels in h hours.

- Identify the independent and dependent variables. Write $d = 630h$ in function notation.
- What are reasonable values for the domain and range in the situation described?
- How far can Air Force One travel in 12 hours?

25. Complete the table for $g(z) = 2z - 5$. 26. Complete the table for $h(x) = x^2 + x$.

z	1	2	3	4
$g(z)$	■	■	■	■

x	0	1	2	3
$h(x)$	■	■	■	■

27. **Estimation** For $f(x) = 3x + 5$, estimate the output when $x = -6.89$, $x = 1.01$, and $x = 4.67$.

28. **Transportation** A car can travel 30 miles on a gallon of gas and has a 20-gallon gas tank. Let g be the number of gallons of gas the car has in its tank. The function rule $d = 30g$ gives the distance d in miles that the car travels on g gallons.

- What are reasonable values for the domain and range in the situation described?
- How far can the car travel on 12 gallons of gas?

29. **Critical Thinking** Give an example of a real-life situation for which the reasonable domain consists of 1, 2, 3, and 4 and the reasonable range consists of 2, 4, 6, and 8.

30. **ERROR ANALYSIS** Rashid saves \$150 each month. He wants to know how much he will have saved in 2 years. He writes the rule $s = m + 150$ to help him figure out how much he will save, where s is the amount saved and m is the number of months he saves. Explain why his rule is incorrect.



31. **Write About It** Give a real-life situation that can be described by a function. Explain which is the independent variable and which is the dependent variable.

LINK
Transportation



Air Force One refers to two specially configured Boeing 747-200B airplanes. The radio call sign when the president is aboard either aircraft or any Air Force aircraft is "Air Force One."

MULTI-STEP TEST PREP



32. This problem will prepare you for the Multi-Step Test Prep on page 260.

The table shows the volume v of water pumped into a pool after t hours.

- Determine a relationship between the time and the volume of water and write an equation.
- Identify the independent and dependent variables.
- If the pool holds 10,000 gallons, how long will it take to fill?

Amount of Water in Pool	
Time (h)	Volume (gal)
0	0
1	1250
2	2500
3	3750
4	5000