

**Practice**

Form G

## Geometric Sequences

**Determine whether each sequence is geometric. If so, find the common ratio.**

- |                        |                             |                         |
|------------------------|-----------------------------|-------------------------|
| 1. 3, 9, 27, 81, ...   | 2. 4, 8, 16, 32, ...        | 3. 4, 8, 12, 16, ...    |
| 4. 4, -8, 16, -32, ... | 5. 1, 0.5, 0.25, 0.125, ... | 6. 100, 30, 9, 2.7, ... |
| 7. -5, 0, 5, 10, ...   | 8. 64, -32, 16, -8, ...     | 9. 1, 4, 9, 16, ...     |

**Find the tenth term of each geometric sequence.**

- |   |                        |  |
|---|------------------------|--|
| 10. 2, 4, 8, ...                                    | 11. 1, 3, 9, ...       | 12. -2, 6, -18, ...                      |
| 13. -3, 9, -27, ...                                 | 14. -3, -12, -48, ...  | 15. -5, 25, -125, ...                    |
| 16. $\frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \dots$ | 17. 0.3, 0.6, 1.2, ... | 18. $\frac{1}{4}, \frac{1}{2}, 1, \dots$ |

**19.** When a pendulum swings freely, the length of its arc decreases geometrically.

Find each missing arc length.

- 20th arc is 20 in.; 22nd arc is 18.5 in.
- 8th arc is 27 mm; 10th arc is 3 mm
- 5th arc is 25 cm; 7th arc is 1 cm
- 100th arc is 18 ft; 98th arc is 2 ft

**Find the missing term of each geometric sequence. It could be the geometric mean or its opposite.**

- |                     |   |                        |
|---------------------|---|------------------------|
| 20. 4, ■, 16, ...   | 21. 9, ■, 16, ...                         | 22. 2, ■, 8, ...       |
| 23. 3, ■, 12, ...   | 24. 2, ■, 50, ...                         | 25. 4, ■, 5.76, ...    |
| 26. 625, ■, 25, ... | 27. $\frac{1}{3}, \blacksquare, 3, \dots$ | 28. 0.5, ■, 0.125, ... |

**29. Writing** Explain how you know that the sequence 400, 200, 100, 50 is geometric.**30. Open-Ended** Write a geometric sequence of at least seven terms.**31. Error Analysis** A student says that the geometric sequence 30, \_\_, 120 can be completed with 90. Is she correct? Explain.

**Practice** (continued)

Form G

## Geometric Sequences

Identify each sequence as *arithmetic*, *geometric*, or *neither*. Then find the next two terms.

32.  $9, 3, 1, \frac{1}{3}, \dots$

33.  $1, 0, -2, -5, \dots$

34.  $2, -2, 2, -2, \dots$

35.  $-3, 2, 7, 12, \dots$

36.  $1, -2, -5, -8, \dots$

37.  $1, -2, 3, -4, \dots$

Write an explicit formula for each sequence. Then generate the first five terms.

38.  $a_1 = 3, r = -2$

39.  $a_1 = 5, r = 3$

40.  $a_1 = -1, r = 4$

41.  $a_1 = -2, r = -3$

42.  $a_1 = 32, r = -0.5$

43.  $a_1 = 2187, r = \frac{1}{3}$

44.  $a_1 = 9, r = 2$

45.  $a_1 = -4, r = 4$

46.  $a_1 = 0.1, r = -2$

47. The deer population in an area is increasing. This year, the population was 1.025 times last year's population of 2537.

- Assuming that the population increases at the same rate for the next few years, write an explicit formula for the sequence.
- Find the expected deer population for the fourth year of the sequence.

48. You enlarge the dimensions of a picture to 150% several times. After the first increase, the picture is 1 in. wide.

- Write an explicit formula to model the width after each increase.
- How wide is the photo after the 2nd increase?
- How wide is the photo after the 3rd increase?
- How wide is the photo after the 12th increase?

Find the missing terms of each geometric sequence. (*Hint: The geometric mean of positive first and fifth terms is the third term. Some terms might be negative.*)

49.  $12, \blacksquare, \blacksquare, \blacksquare, 0.75$

50.  $-9, \blacksquare, \blacksquare, \blacksquare, -2304$

For the geometric sequence  $6, 18, 54, 162, \dots$ , find the indicated term.

51. 6th term

52. 19th term

53.  $n$ th term