Lesson 1.1 • Recursively Defined Sequences

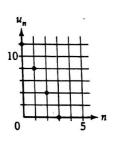
Date Period Name

- 1. Tell whether each sequence is arithmetic, geometric, or neither.
 - **a.** 1, 5, 9, 13, . . .
- **b.** 2, 6, 18, 54, . . .
- c. $1, 1, 2, 3, 5, 8, \ldots$

- **d.** 16, 4, 1, 0.25, . . .
- $e. -1, 1, -1, 1, \ldots$
- f. $5.6, 2.8, 0, -2.8, \ldots$
- 2. Find the common difference, d, for each arithmetic sequence and the common ratio, r, for each geometric sequence.
 - **a.** 6, 11, 16, 21, . . .
- **b.** 100, 10, 1, 0.1, . . .
- c. $1.5, 1.0, 0.5, 0, -0.5, \dots$

- d. $0.0625, 0.125, 0.25, \ldots$ e. $-1, 0.2, -0.04, 0.008, \ldots$ f. $-4, -3.99, -3.98, \ldots$
- 3. Write the first six terms of each sequence, starting with u_1 .
 - a. $u_1 = -18$
 - $u_n = u_{n-1} + 6 \quad \text{where } n \ge 2$
- **b.** $u_1 = 0.5$ $u_n^1 = 3u_{n-1}$ where $n \ge 2$

- c. $u_1 = 35.6$
 - $u_n = u_{n-1} 4.2$ where $n \ge 2$
- - $u_n = -\frac{1}{2}u_{n-1} \quad \text{where } n \ge 2$
- **4.** Write a recursive formula to generate each sequence. Then find the indicated term.
 - \mathbf{a} . -15, -11, -7, -3, ...
- Find the 10th term.
- **b.** 1000, 100, 10, 1, . . .
- Find the 12th term.
- c. 17.25, 14.94, 12.63, 10.32, ... Find the 15th term.
- **d.** 0.3, -0.03, 0.003, -0.0003, ... Find the 8th term.
- e. $0, \frac{1}{6}, \frac{1}{3}, \frac{1}{2}, \dots$
- Find the 21st term.
- f. $-2, 4, -8, 16, \ldots$
- Find the 15th term.
- 5. Indicate whether each situation could be represented by an arithmetic sequence or a geometric sequence. Give the value of the common difference, d, for each arithmetic sequence and of the common ratio, r, for each geometric sequence.
 - a. Phil rented an apartment for \$850 a month. Each time he renewed his lease over the next 3 years, his landlord raised the rent by \$50.
 - b. Leora was hired as a first-year teacher at an annual salary of \$30,000. She received an annual salary increase of 5% for each of the next 4 years.
 - c. A laboratory technician observes that the number of bacteria in a colony doubles every 12 hours.
 - d. The number of students enrolled in a high school is decreasing at a rate of 75 students per year.
- 6. Write a recursive formula for the sequence graphed at right. Find the 42nd term.



CHAPTER 1

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