

Lesson 1.1 • Recursively Defined Sequences

Name _____ Period _____ Date _____

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, ...

d. 16, 4, 1, 0.25, ...

e. -1, 1, -1, 1, ...

f. 5.6, 2.8, 0, -2.8, ...

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, ...

d. 0.0625, 0.125, 0.25, ...

e. -1, 0.2, -0.04, 0.008, ...

f. -4, -3.99, -3.98, ...

3. Write the first six terms of each sequence, starting with u_1 .

a. $u_1 = -18$

$u_n = u_{n-1} + 6$ where $n \geq 2$

b. $u_1 = 0.5$

$u_n = 3u_{n-1}$ where $n \geq 2$

c. $u_1 = 35.6$

$u_n = u_{n-1} - 4.2$ where $n \geq 2$

d. $u_1 = 8$

$u_n = -\frac{1}{2}u_{n-1}$ where $n \geq 2$

4. Write a recursive formula to generate each sequence. Then find the indicated term.

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, ...

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.

