

## Lesson 6 Practice Problems

1. An arithmetic sequence  $a$  starts 2, 5, . . .
  - a. Write a recursive definition for this sequence using function notation.
  - b. Use your definition to make a table of values for  $a(n)$  and find  $a(6)$ .
  
2. A geometric sequence  $g$  starts 1, 3, . . .
  - a. Write a recursive definition for this sequence using function notation.
  - b. Sketch a graph of the first 5 terms of  $g$ .
  - c. Explain how to use the recursive definition to determine  $g(30)$ . (Don't actually determine the value.)
  
3. Match each sequence with one of the recursive definitions. Note that only the part of the definition showing the relationship between the current term and the previous term is given so as not to give away the solutions.
 

A. 3, 15, 75, 375	1. $a(n) = \frac{1}{3} \cdot a(n - 1)$
B. 18, 6, 2, $\frac{2}{3}$	2. $b(n) = b(n - 1) - 4$
C. 1, 2, 4, 7	3. $c(n) = 5 \cdot c(n - 1)$
D. 17, 13, 9, 5	4. $d(n) = d(n - 1) + n - 1$

(From Unit 1, Lesson 5.)

4. Write the first five terms of each sequence.

- a.  $a(1) = 1, a(n) = 3 \cdot a(n - 1), n \geq 2$
- b.  $b(1) = 1, b(n) = -2 + b(n - 1), n \geq 2$
- c.  $c(1) = 1, c(n) = 2 \cdot c(n - 1) + 1, n \geq 2$
- d.  $d(1) = 1, d(n) = d(n - 1)^2 + 1, n \geq 2$
- e.  $f(1) = 1, f(n) = f(n - 1) + 2n - 2, n \geq 2$

(From Unit 1, Lesson 5.)

5. A sequence has  $f(1) = 120, f(2) = 60$ .

- a. Determine the next 2 terms if it is an arithmetic sequence, then write a recursive definition that matches the sequence in the form  $f(1) = 120, f(n) = f(n - 1) + \underline{\hspace{1cm}}$  for  $n \geq 2$ .
- b. Determine the next 2 terms if it is a geometric sequence, then write a recursive definition that matches the sequence in the form  $f(1) = 120, f(n) = \underline{\hspace{1cm}} \cdot f(n - 1)$  for  $n \geq 2$ .

(From Unit 1, Lesson 5.)

6. One hour after an antibiotic is administered, a bacteria population is 1,000,000. Each following hour, it decreases by a factor of  $\frac{1}{2}$ .

- a. Complete the table with the bacteria population at the given times.
- b. Do the bacteria populations make a geometric sequence? Explain how you know.

number of hours	population
1	1,000,000
2	
3	
4	
5	
6	

(From Unit 1, Lesson 2.)