Lesson 7 Practice Problems

1. Here is the recursive definition of a sequence: $f(1) = 10$, $f(n) = f(n-1) - 1.5$ for $n \geq 2$.

    a. Is this sequence arithmetic, geometric, or neither?

    b. List at least the first five terms of the sequence.

    c. Graph the value of the term $f(n)$ as a function of the term number n for at least the first five terms of the sequence.

2. An arithmetic sequence k starts 12, 6, . . .

    a. Write a recursive definition for this sequence.

    b. Graph at least the first five terms of the sequence.

3. An arithmetic sequence a begins 11, 7, . . .

    a. Write a recursive definition for this sequence using function notation.

    b. Sketch a graph of the first 5 terms of a.

    c. Explain how to use the recursive definition to find $a(100)$. (Don't actually determine the value.)

    (From Unit 1, Lesson 6.)

4. A geometric sequence g starts 80, 40, . . .

   a. Write a recursive definition for this sequence using function notation.

   b. Use your definition to make a table of values for $g(n)$ for the first 6 terms.

   c. Explain how to use the recursive definition to find $g(100)$. (Don't actually determine the value.)

(From Unit 1, Lesson 6.)

5. Match each recursive definition with one of the sequences.

   A. $h(1) = 1, h(n) = 2 \cdot h(n-1) + 1$ for $n \geq 2$

   B. $p(1) = 1, p(n) = 2 \cdot p(n-1)$ for $n \geq 2$

   C. $a(1) = 80, a(n) = \frac{1}{2} \cdot a(n-1)$ for $n \geq 2$

   1. 80, 40, 20, 10, 5
   2. 1, 2, 4, 8, 16
   3. 1, 3, 7, 15, 31

(From Unit 1, Lesson 5.)

6. For each sequence, decide whether it could be arithmetic, geometric, or neither.

   a. 25, 5, 1, . . .

   b. 25, 19, 13, . . .

   c. 4, 9, 16, . . .

   d. 50, 60, 70, . . .

   e. $\frac{1}{2}$, 3, 18, . . .

   For each sequence that is neither arithmetic nor geometric, how can you change a single number to make it an arithmetic sequence? A geometric sequence?

(From Unit 1, Lesson 3.)