Skills Objective D

In 1 and 2, an arithmetic sequence is given.
a. Write a formula for the *n*th term. b. Find a_{200}.

1. 19, 25, 31, 37, . . . a. $a_n = 6n + 13$ b. 1213

2. -4, -6.5, -9, -11.5, . . . a. $a_n = -2.5n - 1.5$ b. -501.5

In 3 and 4, a recursive definition for a sequence is given. Write an explicit formula for the sequence.

3. $\begin{cases} a_1 = \frac{3}{5} \\ a_n = a_{n-1} + \frac{2}{5}, \end{cases}$ $a_n = \frac{2}{5}n + \frac{1}{5}$

4. $\begin{cases} d_1 = \pi \\ d_n = d_{n-1} + 2\pi, \end{cases}$ $d_n = 2n\pi - \pi$

5. Write a recursive definition for the sequence defined explicitly by $a_n = 9n - 7$.
$\begin{cases} a_1 = 2 \\ a_n = a_{n-1} + 9, \text{ for } n \geq 2. \end{cases}$

6. An arithmetic sequence has $a_3 = 11.1$ and $a_7 = 23.9$.
   a. Write an explicit formula for the sequence. $a_n = 3.2n + 1.5$
   b. Write a recursive definition for the sequence. $\begin{cases} a_1 = 4.7 \\ a_n = a_{n-1} + 3.2, \text{ for } n \geq 2. \end{cases}$

7. Find the 250th term of the linear sequence 5*p*, 8*p*, 11*p*, 14*p*, . . . 752*p*

Properties Objective F

In 8–10, determine whether or not the given formula describes an arithmetic sequence. Justify your answer. Samples

8. $a_n = n^3 - 6$ No; there is no constant difference.

9. $b_n = 4n + 7$ Yes; there is a constant difference, 4.

10. $c_n = \frac{2}{3}n - \frac{5}{3}$ Yes; there is a constant difference, $\frac{2}{3}$.

Uses Objective G

11. A TV shopping club that had 1218 gold necklaces for $125 each sold 42 necklaces each minute the item was featured.
    a. Write an explicit formula that gives the number of necklaces left a_n after *n* minutes. $a_n = 1218 - 42n$
    b. How many minutes does this item need to be featured before the club would sell out? 29 minutes

§8-1

$a_n = a_1 + (n-1) \cdot d$

$a_1 =$

$a_n = a_{n-1} + d$

A

Vocabulary

1. In your own words, define *arithmetic sequence*.
Sample: A sequence with a constant difference between consecutive terms

Skills Objective D

2. Use the arithmetic sequence 0.5, 0.75, 1.00, 1.25, ...

a. Describe this sequence in words. Arithmetic sequence with first term 0.5, constant difference 0.25

b. Write a recursive definition for this sequence.
$\begin{cases} a_1 = 0.5 \\ a_n = a_{n-1} + 0.25, \text{ for } n \geq 2 \end{cases}$

3. An arithmetic sequence has first term 6 and constant difference 4.

a. Write the first 5 terms of the sequence. 6, 10, 14, 18, 22

b. Write a recursive definition for the sequence.
$\begin{cases} a_1 = 6 \\ a_n = a_{n-1} + 4, \text{ for } n \geq 2 \end{cases}$

Properties Objective F

4. A sequence is defined recursively as $\begin{cases} a_1 = 12 \\ a_n = a_{n-1} - 3, \end{cases}$ for integers $n \geq 2$.

a. Find the first 7 terms of this sequence. 12, 9, 6, 3, 0, -3, -6

b. Is the sequence arithmetic? Justify your answer. Sample: Yes; it has a constant difference of -3.

5. Is the sequence 9, 27, 81, 243, . . . arithmetic? Justify your answer.
Sample: No; there is no constant difference.

Uses Objective G

6. Pak bought a pound of coffee beans. Each morning she uses $\frac{3}{4}$ ounce to brew coffee.

a. How many ounces of coffee beans does she have left after the first morning? $15\frac{1}{4}$ ounces

b. Write a recursive definition for the amount of coffee beans left after n mornings.
$\begin{cases} a_1 = 15\frac{1}{4} \\ a_n = a_{n-1} - \frac{3}{4}, \text{ for } n \geq 2. \end{cases}$