Chapter 9 Practice Test

Short Answer

Generate the first five terms in the sequence using the explicit formula.

1. \( y_n = -5n - 5 \)

2. \( c_n = 12n - 11 \)

3. What is the 15th term in the sequence using the given formula?
\( c_n = 3n - 1 \)

4. Write a recursive formula for the sequence 7, 13, 19, 25, 31, ... Then find the next term.

5. Write a recursive formula for the sequence 7, 4, 1, –2, –5, ... Then find the next term.

6. Write a recursive formula for the sequence 15, 26, 48, 92, 180, ... Then find the next term.

7. Write an explicit formula for the sequence 8, 6, 4, 2, 0, ... Then find \( a_{14} \).

Is the sequence arithmetic? If so, identify the common difference.

8. 13, 20, 27, 34, ...

9. 14, 21, 42, 77, ...

10. –2.4, 9.8, 22, 34.2, ...

11. Find the 50th term of the sequence 5, –2, –9, –16, ...

12. Find the 110th term of the sequence –7, 3, 13, 23, ...

13. Find the 2nd and 3rd term of the sequence –7, ____, ____, –22, –27, ...

14. Find the missing term of the arithmetic sequence 22, ____, 34, ...

Is the sequence geometric? If so, identify the common ratio.

15. 6, 12, 24, 48, ...
16. 2, –4, –16, –36, ...

17. \( \frac{1}{3}, \frac{2}{9}, \frac{4}{27}, \frac{8}{81}, \frac{16}{243}, \ldots \)

What is the fifth term of the geometric sequence?

18. 5, 15, 45, ...

19. \( a_1 = 120, a_2 = 36, a_3 = 10.8, a_6 = 0.2916 \)

Write the explicit formula for the geometric sequence. Then find the fifth term in the sequence.

20. \( a_1 = -4, a_2 = 8, a_3 = -16 \)

What is a possible value for the missing term of the geometric sequence?

21. 50, _, 450, ...

22. 1250, _, 50, ...

23. 39, _, 975, ...
Chapter 9 Practice Test
Answer Section

SHORT ANSWER

1. ANS:
   \(-10, -15, -20, -25, -30\)
   
   PTS: 1  DIF: L3  REF: 9-1 Mathematical Patterns
   OBJ: 9-1.1 To identify mathematical patterns found in a sequence
   NAT: A.1.a  STA: L2.2.1
   TOP: 9-1 Problem 1 Generating a Sequence Using an Explicit Formula
   KEY: sequence  DOK: DOK 1

2. ANS:
   \(1, 13, 25, 37, 49\)
   
   PTS: 1  DIF: L3  REF: 9-1 Mathematical Patterns
   OBJ: 9-1.1 To identify mathematical patterns found in a sequence
   NAT: A.1.a  STA: L2.2.1
   TOP: 9-1 Problem 1 Generating a Sequence Using an Explicit Formula
   KEY: sequence  DOK: DOK 1

3. ANS:
   \(44\)
   
   PTS: 1  DIF: L2  REF: 9-1 Mathematical Patterns
   OBJ: 9-1.1 To identify mathematical patterns found in a sequence
   NAT: A.1.a  STA: L2.2.1
   TOP: 9-1 Problem 1 Generating a Sequence Using an Explicit Formula
   KEY: sequence  DOK: DOK 1

4. ANS:
   \(a_n = a_{n-1} + 6, \text{ where } a_1 = 7; 37\)
   
   PTS: 1  DIF: L2  REF: 9-1 Mathematical Patterns
   OBJ: 9-1.1 To identify mathematical patterns found in a sequence
   NAT: A.1.a  STA: L2.2.1
   TOP: 9-1 Problem 2 Writing a Recursive Definition for a Sequence
   KEY: sequence | recursive formula  DOK: DOK 2

5. ANS:
   \(a_n = a_{n-1} - 3, \text{ where } a_1 = 7; -8\)
   
   PTS: 1  DIF: L4  REF: 9-1 Mathematical Patterns
   OBJ: 9-1.1 To identify mathematical patterns found in a sequence
   NAT: A.1.a  STA: L2.2.1
   TOP: 9-1 Problem 2 Writing a Recursive Definition for a Sequence
   KEY: sequence | recursive formula  DOK: DOK 2
6. ANS:
  \[ a_n = 2a_{n-1} - 4, \text{ where } a_1 = 15; 356 \]

PTS: 1  DIF: L4  REF: 9-1 Mathematical Patterns
OBJ: 9-1.1 To identify mathematical patterns found in a sequence
NAT: A.1.a  STA: L2.2.1
TOP: 9-1 Problem 2 Writing a Recursive Definition for a Sequence
KEY: sequence | recursive formula  DOK: DOK 2

7. ANS:
  \[ a_n = -2n + 10; -18 \]

PTS: 1  DIF: L3  REF: 9-1 Mathematical Patterns
OBJ: 9-1.2 To use a formula to find the nth term of a sequence
NAT: A.1.a  STA: L2.2.1
TOP: 9-1 Problem 3 Writing an Explicit Formula for a Sequence
KEY: sequence | explicit formula  DOK: DOK 2

8. ANS:
  yes; 7

PTS: 1  DIF: L2  REF: 9-2 Arithmetic Sequences
OBJ: 9-2.1 To define, identify, and apply arithmetic sequences
NAT: A.1.a  STA: L2.2.1
TOP: 9-2 Problem 1 Identifying Arithmetic Sequences
KEY: arithmetic sequence  DOK: DOK 2

9. ANS:
  no

PTS: 1  DIF: L2  REF: 9-2 Arithmetic Sequences
OBJ: 9-2.1 To define, identify, and apply arithmetic sequences
NAT: A.1.a  STA: L2.2.1
TOP: 9-2 Problem 1 Identifying Arithmetic Sequences
KEY: arithmetic sequence  DOK: DOK 2

10. ANS:
  yes; 12.2

PTS: 1  DIF: L3  REF: 9-2 Arithmetic Sequences
OBJ: 9-2.1 To define, identify, and apply arithmetic sequences
NAT: A.1.a  STA: L2.2.1
TOP: 9-2 Problem 1 Identifying Arithmetic Sequences
KEY: arithmetic sequence  DOK: DOK 2

11. ANS:
  \[ -338 \]

PTS: 1  DIF: L3  REF: 9-2 Arithmetic Sequences
OBJ: 9-2.1 To define, identify, and apply arithmetic sequences
NAT: A.1.a  STA: L2.2.1
TOP: 9-2 Problem 2 Analyzing Arithmetic Sequences
KEY: arithmetic sequence  DOK: DOK 2
12. ANS: 1083

PTS: 1 DIF: L3 REF: 9-2 Arithmetic Sequences
OBJ: 9-2.1 To define, identify, and apply arithmetic sequences
NAT: A.1.a STA: L2.2.1 TOP: 9-2 Problem 2 Analyzing Arithmetic Sequences
KEY: arithmetic sequence
DOK: DOK 2

13. ANS: –12, –17

PTS: 1 DIF: L3 REF: 9-2 Arithmetic Sequences
OBJ: 9-2.1 To define, identify, and apply arithmetic sequences
NAT: A.1.a STA: L2.2.1 TOP: 9-2 Problem 2 Analyzing Arithmetic Sequences
KEY: arithmetic sequence
DOK: DOK 2

14. ANS: 28

PTS: 1 DIF: L2 REF: 9-2 Arithmetic Sequences
OBJ: 9-2.1 To define, identify, and apply arithmetic sequences
NAT: A.1.a STA: L2.2.1 TOP: 9-2 Problem 3 Using the Arithmetic Mean
KEY: arithmetic sequence | arithmetic mean
DOK: DOK 2

15. ANS: yes; 2

PTS: 1 DIF: L2 REF: 9-3 Geometric Sequences
OBJ: 9-3.1 To define, identify, and apply geometric sequences
NAT: A.1.a STA: L2.2.1 TOP: 9-3 Problem 1 Identifying Geometric Sequences
KEY: geometric sequence
DOK: DOK 2

16. ANS: no

PTS: 1 DIF: L3 REF: 9-3 Geometric Sequences
OBJ: 9-3.1 To define, identify, and apply geometric sequences
NAT: A.1.a STA: L2.2.1 TOP: 9-3 Problem 1 Identifying Geometric Sequences
KEY: geometric sequence
DOK: DOK 2

17. ANS: yes; \( \frac{2}{3} \)

PTS: 1 DIF: L3 REF: 9-3 Geometric Sequences
OBJ: 9-3.1 To define, identify, and apply geometric sequences
NAT: A.1.a STA: L2.2.1 TOP: 9-3 Problem 1 Identifying Geometric Sequences
KEY: geometric sequence
DOK: DOK 2
18. **ANS:**

\[ 405 \]

**PTS:** 1  **DIF:** L2  **REF:** 9-3 Geometric Sequences  
**OBJ:** 9-3.1 To define, identify, and apply geometric sequences  
**NAT:** A.1.a  **STA:** L2.2.1  **TOP:** 9-3 Problem 2 Analyzing Geometric Sequences  
**KEY:** geometric sequence  **DOK:** DOK 2

19. **ANS:**

\[ 0.972 \]

**PTS:** 1  **DIF:** L3  **REF:** 9-3 Geometric Sequences  
**OBJ:** 9-3.1 To define, identify, and apply geometric sequences  
**NAT:** A.1.a  **STA:** L2.2.1  **TOP:** 9-3 Problem 2 Analyzing Geometric Sequences  
**KEY:** geometric sequence  **DOK:** DOK 2

20. **ANS:**

\[
a_n = -4 \cdot (-2)^{n-1}; -64
\]

**PTS:** 1  **DIF:** L4  **REF:** 9-3 Geometric Sequences  
**OBJ:** 9-3.1 To define, identify, and apply geometric sequences  
**NAT:** A.1.a  **STA:** L2.2.1  **TOP:** 9-3 Problem 2 Analyzing Geometric Sequences  
**KEY:** geometric sequence  **DOK:** DOK 2

21. **ANS:**

\[ 150 \]

**PTS:** 1  **DIF:** L2  **REF:** 9-3 Geometric Sequences  
**OBJ:** 9-3.1 To define, identify, and apply geometric sequences  
**NAT:** A.1.a  **STA:** L2.2.1  **TOP:** 9-3 Problem 4 Using a Geometric Mean  
**KEY:** geometric sequence | geometric mean  **DOK:** DOK 2

22. **ANS:**

\[ 250 \]

**PTS:** 1  **DIF:** L3  **REF:** 9-3 Geometric Sequences  
**OBJ:** 9-3.1 To define, identify, and apply geometric sequences  
**NAT:** A.1.a  **STA:** L2.2.1  **TOP:** 9-3 Problem 4 Using a Geometric Mean  
**KEY:** geometric sequence | geometric mean  **DOK:** DOK 2

23. **ANS:**

\[ -195 \]

**PTS:** 1  **DIF:** L4  **REF:** 9-3 Geometric Sequences  
**OBJ:** 9-3.1 To define, identify, and apply geometric sequences  
**NAT:** A.1.a  **STA:** L2.2.1  **TOP:** 9-3 Problem 4 Using a Geometric Mean  
**KEY:** geometric sequence | geometric mean  **DOK:** DOK 2