

# 9-1 Practice

## Mathematical Patterns

Form K

**Find the first five terms of each sequence.**

1.  $a_n = 4n - 1$

Substitute 1 for  $n$  and simplify.

$$a_1 = 4(1) - 1 = 3$$

Substitute 2 for  $n$  and simplify.

$$a_2 = 4(2) - 1 = 7$$

Continue for the numbers 3, 4, and 5.

The first five terms are 3, 7, , , and .

2.  $a_n = n^2 + 4$

3.  $a = \frac{1}{2}n + 2$

4.  $a_n = 3^n$

5.  $a_n = -6n^2$

6. Write an explicit formula for a sequence with 3, 5, 7, 9, and 11 as its first five terms.

**Write a recursive definition for each sequence.**

7. 2, 6, 12, 20, ...

Identify the initial condition.

$$a_1 = 2$$

Use  $n$  to express the relationship between successive terms.

8. 120, 60, 30, 15, ...

9. 3, 8, 13, 18, ...

10. 1, 3, 9, 27, ...

11. 2, 3, 8, 63, ...

12. **Writing** Explain the difference between a recursive definition and an explicit formula.

## 9-1

**Practice** (continued)

Form K

## Mathematical Patterns

Write an explicit formula for each sequence. Then find the tenth term.

13. 7, 10, 13, 16, ...

$$a_n = 3n + 4$$

$$a_{10} = 3(10) + 4 = \boxed{\phantom{000}}$$

14. 8, 9, 10, 11, 12, ...

15.  $-\frac{1}{2}, 0, \frac{1}{2}, 1, 1\frac{1}{2}, \dots$

16. 1, 4, 9, 16, ...

17. 3, 1, -1, -3, -5, ...

18. 1, 7, 25, 79, 241

19. **Reasoning** You and your friend are trying to find the 80th term in the sequence 8, 14, 20, 26, 32, .... You use a recursive definition and your friend uses an explicit formula. Who will find the 80th term first? Why?

20. Your neighbor recently began learning to play the guitar. On the first day, she practiced for 0.4 h. On the second day, she practiced for 0.5 h. She practiced for 0.65 h on the third day, and 0.85 h on the fourth day. If this pattern continues, how long will she practice on the seventh day?

21. Charles lost two rented movies, so he owes the rental store a fee of \$40. At the end of each month, the amount that Charles owes will increase by 5%, plus a \$2 billing fee. How much money will Charles owe the rental store after 8 months?