12.1 EXERCISES

SKILL PRACTICE

1. **VOCABULARY** Copy and complete: Another name for summation notation is __?__.

2. **WRITING** *Explain* the difference between a sequence and a series.

EXAMPLE 1
on p. 794
for Exs. 3–14

WRITING TERMS Write the first six terms of the sequence.

3. $a_n = n + 2$ 4. $a_n = 6 - n$ 5. $a_n = n^2$ 6. $f(n) = n^3 + 2$

7. $a_n = 4^{n-1}$ 8. $a_n = -n^2$ 9. $f(n) = n^2 - 5$ 10. $a_n = (n + 3)^2$

11. $f(n) = -\dfrac{4}{n}$ 12. $a_n = \dfrac{3}{n}$ 13. $a_n = \dfrac{2n}{n + 2}$ 14. $f(n) = \dfrac{n}{2n - 1}$

EXAMPLE 2
on p. 795
for Exs. 15–27

WRITING RULES For the sequence, describe the pattern, write the next term, and write a rule for the nth term.

15. 1, 6, 11, 16, . . .   16. 1, 2, 4, 8, . . .   17. $-4, 8, -12, 16, \ldots$

18. 2, 9, 28, 65, . . .   **19.** $\dfrac{2}{3}, \dfrac{2}{6}, \dfrac{2}{9}, \dfrac{2}{12}, \ldots$ 20. $\dfrac{2}{3}, \dfrac{4}{4}, \dfrac{6}{5}, \dfrac{8}{6}, \ldots$

21. $\dfrac{1}{4}, \dfrac{2}{4}, \dfrac{3}{4}, \dfrac{4}{4}, \dfrac{5}{4}, \ldots$ 22. $\dfrac{1}{10}, \dfrac{3}{20}, \dfrac{5}{30}, \dfrac{7}{40}, \ldots$ 23. 3.1, 3.8, 4.5, 5.2, . . .
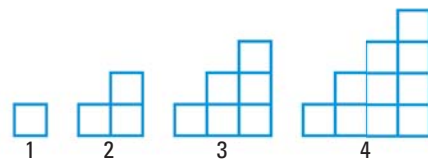
24. 4.2, 2.6, 1, $-0.6, -2.2, \ldots$ 25. 1.2, 4.2, 9.2, 16.2, . . .   26. 9, 16.8, 24.6, 32.4, . . .

27. ◆ **TAKS REASONING** Which rule gives the total number of squares in the nth figure of the pattern shown?

(A) $a_n = 3n - 3$ **(B)** $a_n = 4n - 5$ **(C)** $a_n = n$ **(D)** $a_n = \dfrac{n(n + 1)}{2}$

EXAMPLE 3
on p. 795
for Exs. 28–36

GRAPHING SEQUENCES Graph the sequence.

28. $-2, -5, -8, -11, -14$ 29. 2, 4, 8, 16, 32, 64   30. 1, 5, 9, 13, . . . , 29

31. $-2, 4, -6, 8, \ldots, -22$ 32. 0, 3, 8, 15, 24, 35   33. $-1, 0, 1, 8, 27$

34. 4, $-9, 14, -19, 24$ 35. $\dfrac{1}{2}, \dfrac{3}{2}, \dfrac{5}{2}, \ldots, \dfrac{13}{2}$ 36. $\dfrac{1}{9}, \dfrac{2}{8}, \dfrac{3}{7}, \dfrac{4}{6}, \ldots, \dfrac{9}{1}$

EXAMPLE 4
on p. 796
for Exs. 37–44

WRITING SUMMATION NOTATION Write the series using summation notation.

37. $7 + 10 + 13 + 16 + 19$ 38. $5 + 11 + 17 + 23 + 29$

39. $-1 + 1 + 3 + 5 + 7 + \cdots$ 40. $-2 + 4 - 8 + 16 - 32 + \cdots$

41. $3 + 10 + 17 + 24 + 31 + \cdots$ 42. $\dfrac{1}{3} + \dfrac{1}{9} + \dfrac{1}{27} + \dfrac{1}{81}$

43. $\dfrac{1}{4} + \dfrac{2}{5} + \dfrac{3}{6} + \dfrac{4}{7} + \dfrac{5}{8} + \dfrac{6}{9} + \dfrac{7}{10}$ 44. $-1 + 2 + 7 + 14 + 23 + \cdots$