

LESSON
5-2

Practice B
Series and Summation Notation

Write each series in summation notation.

1. $-2 + 4 - 8 + 16 - 32$

2. $\frac{1}{10} + \frac{1}{100} + \frac{1}{1,000} + \frac{1}{10,000}$

3. $-6 - 1 + 4 + 9 + 14 + 19$

4. $\frac{1}{3} + \frac{1}{6} + \frac{1}{9} + \frac{1}{12} + \frac{1}{15} + \frac{1}{18}$

5. $7 + 13 + 19 + 25 + 31$

6. $-1 + 1 - 1 + 1 - 1 + 1 - 1$

Expand each series and evaluate.

7. $\sum_{k=4}^8 \frac{k}{4}$

a. Expand. _____

b. Simplify. _____

8. $\sum_{k=1}^4 5^{k-2}$

a. Expand. _____

b. Simplify. _____

9. $\sum_{k=2}^6 (-2^k)$

a. Expand. _____

b. Simplify. _____

10. $\sum_{k=30}^{39} (70 - 2k)$

a. Expand. _____

b. Simplify. _____

Evaluate each series.

11. $\sum_{k=12}^{20} 3$

12. $\sum_{k=1}^{40} k$

13. $\sum_{k=1}^{10} k^2$

Solve.

14. One day, Hannah starts a new online Internet club by convincing two of her friends to join. The next day, each member convinces two more people to join. The third day of the club, each member convinces two more people to join, and so on for a full week.

a. Write a series that represents the number of club members at the end of n days. _____

b. Write a series that represents the number of club members at the end of one week. _____

c. How many members will the club have at the end of a week? _____

Reading Strategies

- Each term value is 1 less than the term number; $a_n = n - 1$.
- Each term value is twice the term number; $a_n = 2n$.
- Each term value is 5 plus 4 times the previous term number; $a_n = 5 + 4(n - 1) = 4n + 1$.
- Each term is 75 minus 9 times the previous term number; $a_n = 75 - 9(n - 1) = 84 - 9n$.
- 46, 49, 52, 55
- 12, -19, -26, -33 7. 65, 77, 89, 101

$$13. a. \sum_{k=1}^n 16$$

$$b. \sum_{k=1}^{52} 16$$

c. \$832

Practice B

$$1. \sum_{k=1}^5 (-2)^k$$

$$2. \sum_{k=1}^4 \left(\frac{1}{10}\right)^k$$

$$3. \sum_{k=1}^6 (5k - 11)$$

$$4. \sum_{k=1}^6 \frac{1}{3k}$$

$$5. \sum_{k=1}^5 (6k + 1)$$

$$6. \sum_{k=1}^7 (-1)^k$$

$$7. a. 1 + \frac{5}{4} + \frac{6}{4} + \frac{7}{4} + 2$$

$$b. 7\frac{1}{2}$$

$$8. a. \frac{1}{5} + 1 + 5 + 25$$

$$b. 31\frac{1}{5}$$

$$9. a. 4 - 8 + 16 - 32 + 64$$

$$b. 44$$

$$10. a. 10 + 8 + 6 + 4 + 2 + 0 - 2 - 4 - 6 - 8$$

$$b. 10$$

$$11. 27$$

$$12. 820$$

$$13. 385$$

$$14. a. \sum_{k=1}^n 3^k$$

$$b. \sum_{k=1}^7 3^k$$

$$c. 3279$$

Practice C

$$1. \sum_{k=1}^5 3(2^k)$$

$$2. \sum_{k=1}^7 \frac{3}{2k}$$

$$3. \sum_{k=1}^7 (-1)^{k-1}$$

$$4. \sum_{k=1}^5 \left(\frac{1}{10}\right)^{k-2}$$

5-2 SERIES AND SUMMATION NOTATION

Practice A

$$1. a. a_k = 2^k$$

$$b. \sum_{k=1}^6 2^k$$

$$2. \sum_{k=1}^5 (k - 7)$$

$$3. \sum_{k=1}^6 (3k + 1)$$

$$4. \sum_{k=1}^4 (2k^2)$$

$$5. \sum_{k=1}^5 (-3)^k$$

$$6. \sum_{k=1}^7 (20 - 4k)$$

$$7. \sum_{k=1}^5 -(k^2)$$

$$8. a. 18 + 32 + 50 + 72 + 98$$

$$b. 270$$

$$9. a. 2 + 1 + \frac{2}{3} + \frac{1}{2}$$

$$b. 4\frac{1}{6}$$

$$10. a. -2 - 1 + 0 + 1 + 2 + 3$$

$$b. 3$$

$$11. a. 20 + 40 + 80$$

$$b. 140$$

$$12. a. -3 - 6 - 9 - 12 - 15$$

$$b. -45$$