## CONCEPT AND VOCABULARY CHECK

*Fill in each blank so that the resulting statement is true.*

1. A sequence in which each term after the first differs from the preceding term by a constant amount is called a/an _____ sequence. The difference between consecutive terms is called the _____ of the sequence.
2. The $n$th term of the sequence described in Exercise 1 is given by the formula $a_n =$ _____, where $a_1$ is the _____ and $d$ is the _____ of the sequence.
3. The sum, $S_n$, of the first $n$ terms of the sequence described in Exercise 1 is given by the formula $S_n =$ _____, where $a_1$ is the _____ and $a_n$ is the _____.
4. The first term of $\sum_{i=1}^{20}(6i - 4)$ is ____ and the last term is _____.
5. The first three terms of $\sum_{i=1}^{17}(5i + 3)$ are ____, ____, and _____. The common difference is ____.

## EXERCISE SET 8.2

### Practice Exercises

*In Exercises 1–14, write the first six terms of each arithmetic sequence.*

1. $a_1 = 200, d = 20$
2. $a_1 = 300, d = 50$
3. $a_1 = -7, d = 4$
4. $a_1 = -8, d = 5$
5. $a_1 = 300, d = -90$
6. $a_1 = 200, d = -60$
7. $a_1 = \frac{5}{2}, d = -\frac{1}{2}$
8. $a_1 = \frac{3}{4}, d = -\frac{1}{4}$
9. $a_n = a_{n-1} + 6, a_1 = -9$
10. $a_n = a_{n-1} + 4, a_1 = -7$
11. $a_n = a_{n-1} - 10, a_1 = 30$
12. $a_n = a_{n-1} - 20, a_1 = 50$
13. $a_n = a_{n-1} - 0.4, a_1 = 1.6$
14. $a_n = a_{n-1} - 0.3, a_1 = -1.7$

*In Exercises 15–22, find the indicated term of the arithmetic sequence with first term, $a_1$, and common difference, $d$.*

15. Find $a_6$ when $a_1 = 13, d = 4$.
16. Find $a_{16}$ when $a_1 = 9, d = 2$.
17. Find $a_{50}$ when $a_1 = 7, d = 5$.
18. Find $a_{60}$ when $a_1 = 8, d = 6$.
19. Find $a_{200}$ when $a_1 = -40, d = 5$.
20. Find $a_{150}$ when $a_1 = -60, d = 5$.
21. Find $a_{60}$ when $a_1 = 35, d = -3$.
22. Find $a_{70}$ when $a_1 = -32, d = 4$.

*In Exercises 23–34, write a formula for the general term (the nth term) of each arithmetic sequence. Do not use a recursion formula. Then use the formula for $a_n$ to find $a_{20}$, the 20th term of the sequence.*

23. $1, 5, 9, 13, \ldots$
24. $2, 7, 12, 17, \ldots$
25. $7, 3, -1, -5, \ldots$
26. $6, 1, -4, -9, \ldots$
27. $a_1 = 9, d = 2$
28. $a_1 = 6, d = 3$
29. $a_1 = -20, d = -4$
30. $a_1 = -70, d = -5$
31. $a_n = a_{n-1} + 3, a_1 = 4$
32. $a_n = a_{n-1} + 5, a_1 = 6$
33. $a_n = a_{n-1} - 10, a_1 = 30$
34. $a_n = a_{n-1} - 12, a_1 = 24$
35. Find the sum of the first 20 terms of the arithmetic sequence: $4, 10, 16, 22, \ldots$.
36. Find the sum of the first 25 terms of the arithmetic sequence: $7, 19, 31, 43, \ldots$.
37. Find the sum of the first 50 terms of the arithmetic sequence: $-10, -6, -2, 2, \ldots$.
38. Find the sum of the first 50 terms of the arithmetic sequence: $-15, -9, -3, 3, \ldots$.
39. Find $1 + 2 + 3 + 4 + \cdots + 100$, the sum of the first 100 natural numbers.
40. Find $2 + 4 + 6 + 8 + \cdots + 200$, the sum of the first 100 positive even integers.
41. Find the sum of the first 60 positive even integers.
42. Find the sum of the first 80 positive even integers.
43. Find the sum of the even integers between 21 and 45.
44. Find the sum of the odd integers between 30 and 54.

*For Exercises 45–50, write out the first three terms and the last term. Then use the formula for the sum of the first n terms of an arithmetic sequence to find the indicated sum.*

45. $\sum_{i=1}^{17}(5i + 3)$
46. $\sum_{i=1}^{20}(6i - 4)$
47. $\sum_{i=1}^{30}(-3i + 5)$
48. $\sum_{i=1}^{40}(-2i + 6)$
49. $\sum_{i=1}^{100}4i$
50. $\sum_{i=1}^{50}(-4i)$