ACTIVITY 19 PRACTICE

Write your answers on notebook paper.
Show your work.

Lesson 19-1

1. Determine whether or not each sequence is arithmetic. If the sequence is arithmetic, state the common difference.
   a. 4, 5, 7, 10, . . .
   b. 5, 7, 9, 11, . . .
   c. 12, 9, 6, 3, . . .

2. Determine whether or not each sequence is arithmetic. If the sequence is arithmetic, use the explicit formula to write a general expression for a_n in terms of n.
   a. 4, 12, 20, 28, . . .
   b. 5, 10, 20, 40, . . .
   c. 4, 0, −4, −8, . . .

3. Determine whether or not each sequence is arithmetic. If the sequence is arithmetic, use the recursive formula to write a general expression for a_n in terms of a_{n-1}.
   a. 7, 7.5, 8, 8.5, . . .
   b. 6, 7, 8, 9, . . .
   c. −2, 4, −8, . . .

4. Find the indicated term of each arithmetic sequence.
   a. $a_1 = 4, d = 5; a_{15}$
   b. 14, 18, 22, 26, . . .; a_{20}
   c. 45, 41, 37, 33, . . .; a_{18}

5. Find the sequence for which a_8 does NOT equal 24.
   A. 3, 6, 9, . . .
   B. −32, −24, −16, . . .
   C. 108, 96, 84, . . .
   D. −8, −4, 0, . . .

6. A radio station offers a $100 prize on the first day of a contest. Each day that the prize money is not awarded, $50 is added to the prize amount. If a contestant wins on the 17th day of the contest, how much money will be awarded?

7. If $a_4 = 20$ and $a_{12} = 68$, find a_1, a_2, and a_3.

8. Find the indicated term of each arithmetic sequence.
   a. $a_1 = -2, d = 4; a_{12}$
   b. 15, 19, 23, 27, . . .; a_{10}
   c. 46, 40, 34, 28, . . .; a_{20}

9. What is the first value of n that corresponds to a positive value? Explain how you found your answer.

n	1	2	3	4	5
a_n	−42.5	−37.8	−33.1	−28.4	−23.7

10. Find the first four terms of the sequence with $a_1 = \frac{2}{3}$ and $a_n = a_{n-1} + \frac{1}{6}$.

11. If $a_1 = 3.1$ and $a_5 = -33.7$, write an expression for the sequence and find a_2, a_3, and a_4.

Lesson 19-2

12. Find the indicated partial sum of each arithmetic series.
   a. $a_1 = 4, d = 5; S_{10}$
   b. $14 + 18 + 22 + 26 + \ldots; S_{12}$
   c. $45 + 41 + 37 + 33 + \ldots; S_{18}$

13. Find the indicated partial sum of each arithmetic series.
   a. $1 + 3 + 5 + \ldots; S_6$
   b. $1 + 3 + 5 + \ldots; S_{10}$
   c. $1 + 3 + 5 + \ldots; S_{12}$
   d. Explain the relationship between n and S_n in parts a–c.

14. Find the indicated partial sum of the arithmetic series.

   $0 + (x + 2) + (2x + 4) + (3x + 6) + \ldots; S_{10}$

   A. $9x + 18$
   B. $10x + 20$
   C. $45x + 90$
   D. $55x + 110$

15. Two companies offer you a job. Company A offers you a $40,000 first-year salary with an annual raise of $1500. Company B offers you a $38,500 first-year salary with an annual raise of $2000.
   a. What would your salary be with Company A as you begin your sixth year?
   b. What would your salary be with Company B as you begin your sixth year?
   c. What would be your total earnings with Company A after 5 years?
   d. What would be your total earnings with Company B after 5 years?

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16. If $S_{12} = 744$ and $a_1 = 40$, find d.

17. In an arithmetic series, $a_1 = 47$ and $a_7 = -13$, find d and S_7.

18. In an arithmetic series, $a_9 = 9.44$ and $d = 0.4$, find a_1 and S_9.

19. The first prize in a contest is \$500, the second prize is \$450, the third prize is \$400, and so on.
- **a.** How many prizes will be awarded if the last prize is \$100?
- **b.** How much money will be given out as prize money?

20. Find the sum of $13 + 25 + 37 + \ldots + 193$.
- **A.** 1339
- **B.** 1648
- **C.** 1930
- **D.** 2060

21. Find the sum of the first 150 natural numbers.

22. A store puts boxes of canned goods into a stacked display. There are 20 boxes in the bottom layer. Each layer has two fewer boxes than the layer below it. There are five layers of boxes. How many boxes are in the display? Explain your answer.

Lesson 19-3

23. Find the indicated partial sum of each arithmetic series.
- **a.** $\sum_{j=1}^{5}(5-6j)$
- **b.** $\sum_{j=1}^{20}5j$
- **c.** $\sum_{j=5}^{15}(5-j)$

24. Does $\sum_{j=1}^{10}(2j+1) = \sum_{j=1}^{5}(2j+1) + \sum_{j=6}^{10}(2j+1)$? Verify your answer.

25. Does $\sum_{j=4}^{9}(j-7) = \sum_{j=1}^{9}(j-7) - \sum_{j=1}^{3}(j-7)$? Verify your answer.

26. Which statement is true for the partial sum $\sum_{j=1}^{n}(4j+3)$?
- **A.** For $n = 5$, the sum is 35.
- **B.** For $n = 7$, the sum is 133.
- **C.** For $n = 10$, the sum is 230.
- **D.** For $n = 12$, the sum is 408.

27. Evaluate.
- **a.** $\sum_{j=1}^{6}(j+3)$
- **b.** $\sum_{j=10}^{15}(j-12)$
- **c.** $\sum_{j=1}^{8}(4j)$

28. Which is greater: $\sum_{j=4}^{8}(-3j+29)$ or $\sum_{j=4}^{8}-3j+29$?

29. Which expression is the sum of the series $7 + 10 + 13 + \ldots + 25$?
- **A.** $\sum_{j=1}^{7}4+3j$
- **B.** $\sum_{j=1}^{7}(4-3j)$
- **C.** $\sum_{j=1}^{7}(3+4j)$
- **D.** $\sum_{j=1}^{7}(4+3j)$

30. Evaluate $\sum_{j=1}^{5}\left(\frac{j \bullet \pi}{2}\right)$.

MATHEMATICAL PRACTICES
Look For and Make Use of Structure

31. How does the common difference of an arithmetic sequence relate to finding the partial sum of an arithmetic series?

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