Practice

Arithmetic Series

Find the sum of each finite arithmetic series.

1. $1 + 3 + 5 + 7 + 9$

3. $4 + 9 + 14 + \ldots + 44$

5. $17 + 25 + 33 + \ldots + 65$

7. A bookshelf has 7 shelves of different widths. Each shelf is narrower than the shelf below it. The bottom three shelves are 36 in., 31 in., and 26 in. wide.

a. The shelf widths decrease by the same amount from bottom to top. What is the width of the top shelf?

b. What is the total shelf space of all seven shelves?

Write each arithmetic series in summation notation.

9. $10 + 7 + 4 + \ldots + (-5)$

11. $3 + 7 + 11 + \ldots + 31$

13. $15 + 25 + 35 + \ldots + 75$

Find the sum of each finite series.

15. $\displaystyle\sum_{n=2}^{6} (2n - 1)$

17. $\displaystyle\sum_{n=2}^{5} (5n + 3)$

19. $\displaystyle\sum_{n=1}^{8} (3 - n)$

21. $\displaystyle\sum_{n=1}^{4} (-n - 3)$

Use a graphing calculator to find the sum of each series.

23. $\displaystyle\sum_{n=1}^{15} (n + 3)$

25. $\displaystyle\sum_{n=1}^{20} 2n^2$

27. $\displaystyle\sum_{n=1}^{50} (n^2 - 4n)$

Determine whether each list is a *sequence* or a *series* and *finite* or *infinite*.

29. 7, 12, 17, 22, 27

31. 8, 8.2, 8.4, 8.6, 8.8, 9.0, ...

33. 40, 20, 10, 5, 2.5, 1.25, ...

35. An embroidery pattern calls for five stitches in the first row and for three more stitches in each successive row. The 25th row, which is the last row, has 77 stitches. Find the total number of stitches in the pattern.

37. Writing Explain how you can identify the difference between a series and a sequence.

39. Error Analysis A student identifies the series 10 + 15 + 20 + 25 + 30 as an infinite arithmetic series. Is he correct? Explain.

41. To train new employees, an employer offers a bonus after 30 work days as follows. An employee must turn in one report on the first day; the number of reports for each subsequent day must increase by two. What is the minimum number of reports an employee will have to turn in over the 30 days to earn the bonus?