In Exercises 1–6, write each sum using summation notation, assuming the suggested pattern continues.

1. $-7 - 1 + 5 + 11 + \cdots + 53$

2. $2 + 5 + 8 + 11 + \cdots + 29$

3. $1 + 4 + 9 + \cdots + (n + 1)^2$

In Exercises 7–12, find the sum of the arithmetic sequence.

9. 1, 2, 3, 4, . . . , 80

11. 117, 110, 103, . . . , 33

12. 111, 108, 105, . . . , 27

In Exercises 13–16, find the sum of the geometric sequence.

13. 3, 6, 12, . . . , 12,288

14. 5, 15, 45, . . . , 98,415

16. $42, -7, \frac{7}{6}, \ldots, 42\left(-\frac{1}{6}\right)^9$

In Exercises 17–22, find the sum of the first n terms of the sequence. The sequence is either arithmetic or geometric.

17. $2, 5, 8, \ldots; n = 10$

19. $4, -2, 1, -\frac{1}{2}, \ldots; n = 12$

21. $-1, 11, -121, \ldots; n = 9$

22. $-2, 24, -288, \ldots; n = 8$

In Exercises 25–30, determine whether the infinite geometric series converges. If it does, find its sum.

25. $6 + 3 + \frac{3}{2} + \frac{3}{4} + \cdots$

27. $\frac{1}{64} + \frac{1}{32} + \frac{1}{16} + \frac{1}{8} + \cdots$

28. $\frac{1}{48} + \frac{1}{16} + \frac{3}{16} + \frac{9}{16} + \cdots$

29. $\sum_{j=1}^{\infty} 3\left(\frac{1}{4}\right)^{j}$

30. $\sum_{n=1}^{\infty} 5\left(\frac{2}{3}\right)^{n}$

In Exercises 31–34, express the rational number as a fraction of integers.

31. 7.14141414 . . .