

Chapter 12

12.1 For the sequence, describe the pattern, write the next term, and write a rule for the n th term.

1. 9, 16, 25, 36, ...

2. $\frac{1}{3}, \frac{2}{3}, 1, \frac{4}{3}, \dots$

3. 12.5, 7, 1.5, -4, ...

12.1 Write the series using summation notation.

4. $16 + 32 + 48 + 64 + \dots + 144$

5. $\frac{1}{6} + \frac{2}{7} + \frac{3}{8} + \frac{4}{9} + \frac{1}{2} + \dots$

12.1 Find the sum of the series.

6. $\sum_{i=1}^5 (3i + 2)$

7. $\sum_{i=0}^5 4i^2$

8. $\sum_{n=4}^6 \frac{n}{n+3}$

9. $\sum_{k=6}^8 k^3$

12.2 Write a rule for the n th term of the arithmetic sequence. Then graph the first six terms of the sequence.

10. $a_5 = 15, d = 6$

11. $a_{10} = -78, d = -10$

12. $a_6 = -\frac{11}{5}, d = -\frac{2}{5}$

12.2 Write a rule for the n th term of the arithmetic sequence. Then find a_{15} .

13. 11, 20, 29, 38, ...

14. -8, -15, -22, -29, ...

15. $3, \frac{7}{3}, \frac{5}{3}, 1, \dots$

12.2 Write a rule for the n th term of the arithmetic sequence that has the two given terms.

16. $a_2 = 9, a_7 = 37$

17. $a_8 = 10.5, a_{16} = 18.5$

18. $a_3 = -\frac{14}{5}, a_{10} = -\frac{42}{5}$

12.3 Write a rule for the n th term of the geometric sequence. Then find a_{10} .

19. $\frac{1}{27}, \frac{1}{9}, \frac{1}{3}, 1, \dots$

20. 5, 4, 3.2, 2.56, ...

21. $4, \frac{16}{3}, \frac{64}{9}, \frac{256}{27}, \dots$

12.3 Find the sum of the geometric series.

22. $\sum_{i=1}^4 3(4)^{i-1}$

23. $\sum_{i=1}^7 0.5(-3)^{i-1}$

24. $\sum_{i=1}^5 10\left(\frac{3}{5}\right)^{i-1}$

25. $\sum_{i=1}^7 2(1.2)^{i-1}$

12.4 Find the sum of the infinite geometric series, if it exists.

26. $8 + 4 + 2 + 1 + \dots$

27. $2 - 4 + 8 - 16 + \dots$

28. $-6.75 + 4.5 - 3 + 2 - \dots$

12.4 Write the repeating decimal as a fraction in lowest terms.

29. 0.333...

30. 0.898989...

31. 0.212121...

32. 1.50150150...

12.5 Write a recursive rule for the sequence. The sequence may be arithmetic, geometric, or neither.

33. 2.5, 5, 10, 20, ...

34. 2, -2, -6, -10, ...

35. 1, 2, 2, 4, 8, 32, ...

12.5 Find the first three iterates of the function for the given initial value.

36. $f(x) = 2x - 5, x_0 = 3$

37. $f(x) = \frac{4}{5}x - 2, x_0 = -10$

38. $f(x) = 3x^2 + x, x_0 = -1$