

EXERCISES

Find the next five terms of each sequence.

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| 1. 2, 4, 7, 11, 16, | 2. 1, 2, 5, 10, 17, | 3. 0, 2, 6, 12, 20, |
| 4. 2, 3, 6, 11, 18, | 5. 1, 1, 2, 3, 5, 8, | 6. 1, 5, 6, 11, 17, |
| 7. 1, 2, 4, 8, 16, | 8. 3, 4, 7, 11, 18, | 9. 2, 3, 5, 8, 13, |
| 10. 1, 4, 9, 16, 25, | 11. 9, 10, 13, 18, 25, | 12. 0, 0.5, 2, 4.5, 8, |
| 13. 4, 5.5, 8, 11.5, 16, | 14. -9, -8, -6, -3, 1, | 15. -9, -10, -12, -15, -19, |
| 16. 5, -10, 15, -20, 25, | 17. 1, $\frac{1}{2}$, 3, $\frac{1}{4}$, 5, | 18. $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{6}$, |
| 19. 1, $-\frac{1}{2}$, 3, $-\frac{1}{4}$, 5, | 20. $\frac{1}{2}$, $-\frac{1}{4}$, $\frac{1}{6}$, $-\frac{1}{8}$, $\frac{1}{10}$ | |

Find the sum of each sequence.

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| 21. $\sum_{k=1}^5 4$ | 22. $\sum_{k=1}^{50} 6$ | 23. $\sum_{k=1}^{10} k$ | 24. $\sum_{k=1}^{10} (-k)$ | 25. $\sum_{k=1}^4 (k^2 + 1)$ |
| 26. $\sum_{k=0}^3 (k^3 + 2)$ | 27. $\sum_{k=2}^5 (-1)^k 2^k$ | 28. $\sum_{k=2}^5 (-1)^k k^2$ | 29. $\sum_{k=0}^4 (-1)^k \frac{1}{k+1}$ | 30. $\sum_{y=0}^5 (x + y)$ |

Write the first five terms of each recursive sequence.

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| 31. $a_1 = 5$, $a_{n+1} = a_n + 2$ | 32. $a_1 = 5$, $a_{n+1} = a_n - 2$ |
| 33. $a_1 = -3$, $a_{n+1} = a_n + n$ | 34. $a_1 = x$, $a_{n+1} = a_n + d$ |
| 35. $a_1 = 1$, $a_2 = 2$, $a_{n+2} = a_n a_{n+1}$ | 36. $a_1 = 1$, $a_2 = 2$, $a_{n+2} = na_n + a_{n+1}$ |

Write each sum using summation notation.

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| 37. $1 + 2 + 3 + 4 + \dots + 30$ | 38. $1^2 + 2^2 + 3^2 + 4^2 + \dots + 10^2$ |
| 39. $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots + \frac{1}{10}$ | 40. $1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots - \frac{1}{128}$ |
| 41. $\frac{1}{1^3} + \frac{1}{2^4} + \frac{1}{3^5} + \dots + \frac{1}{10^{12}}$ | 42. $a + (a + d) + (a + 2d) + [a + (n - 1)d]$ |

Write the first five terms of each sequence.

43. $\{n^2 - 1\}$ 44. $\left\{\frac{n}{2^n}\right\}$ 45. $\left\{\frac{n}{n+3}\right\}$ 46. $\{(-1)^n n^2\}$ 47. $\left\{(-1)^{n+1} \frac{1}{n(n+1)}\right\}$

48. The bus schedule at a station is at these times: 8:00, 8:05, 8:15, 8:30. If this pattern continues, what is the time of the next bus?
49. How many games have to be played to determine a final winner from 16 teams in a single-elimination competition?
50. There are 9 students in the party. Each student shakes hands exactly once with each of the others. How many handshakes take place?
51. What is the greatest number of pieces we can get from a round pizza with 1, 2, 3, 4 or 5 cuts?

52. Evaluate $\sum_{k=1}^9 \log_{10} \frac{k+1}{k}$.
53. Evaluate $\sum_{k=2}^{11} \log_{10} \frac{k-1}{k}$.