

Quadratic Sequences



Quadratic sequences take the form

$$an^2 + bn + c$$

Section 1

For each of the following quadratic sequences, identify the values of a, b and c:

1. $2n^2 + 3n + 4$

4. $n^2 + n - 2$

2. $4n^2 + 8n + 5$

5. $\frac{n^2}{2} - 4$

3. $5n^2 - 11n$

6. $-n^2$

Find the first 3 terms for these quadratic sequences:

Section 2

7. $n^2 + 3$

10. $4n^2 - 30$

13. $\frac{n^2}{2} + 3n + 9$

8. $2n^2 + 2$

11. $n^2 + n - 9$

14. $n(n + 3)$

9. $3n^2$

12. $2n^2 - 2n - 4$

15. $(n + 3)(2n + 6)$

Find the 10th and 100th term of these sequences:

16. $n^2 + 3$

18. $-8n^2$

17. $2n^2 - 4n$

19. $\frac{n^2}{3} + 20$

Which of these terms are **not** in the sequences provided in **bold**:

Section 3

20. {12, 39, 55, 103} ($n^2 + 3$)

22. {108, 116, 128, 162} ($2n^2$)

21. {15, 35, 63, 82} ($n^2 - 1$)

23. {1, 38, 56, 119} ($n^2 + 10n$)

Match the sequences to the descriptions below (assume n is always a whole number):

24. $n^2 + 1$

A: Always even

25. $n^2 + n$

B: Always odd

26. $n^2 \div 3$

C: Sometimes even, sometimes odd

27. $2n^2$

D: Sometimes an integer

28. $n^2 + 3n + \frac{3}{5}$

E: Never an integer

Section 4

Find the nth term of these quadratic sequences:

29. 1, 4, 9, 16

34. 0, 6, 16, 30

39. 3, 7, 13, 21

30. -3, 0, 5, 12

35. 8, 14, 24, 38

40. 5, 13, 25, 41

31. 3, 12, 27, 48

36. 11, 20, 35, 56

41. 7, 16, 27, 40

32. 2, 5, 10, 17

37. 0.5, 2, 4.5, 8

42. 0, 1, 4, 9

33. 8, 11, 16, 23

38. 9.3, 10.3, 12, 14.3

43. -5, 8, 27, 52

Easiest

Medium

Hardest

Answers

1. $a = 2, b = 3, c = 4$
2. $a = 4, b = 8, c = 5$
3. $a = 5, b = -11, c = 0$
4. $a = 1, b = 1, c = -2$
5. $a = \frac{1}{2}, b = 0, c = -4$
6. $a = -1, b = 0, c = 0$
7. 4, 7, 12
8. 4, 10, 20
9. 3, 12, 27
10. -26, -14, 6
11. -7, -3, 3
12. -4, 0, 8
13. 12.5, 17, 22.5
14. 4, 10, 18
15. 32, 50, 72
16. 103, 10003
17. 160, 19600
18. -800, -80000
19. $53 \frac{1}{3}, 3353 \frac{1}{3}$
20. 55
21. 82
22. 108, 116
23. 1, 38
24. C
25. A
26. C (although sometimes neither) & D
27. A
28. E
29. n^2
30. $n^2 - 4$
31. $3n^2$
32. $n^2 + 1$
33. $n^2 + 7$
34. $2n^2 - 2$
35. $2n^2 + 6$
36. $3n^2 + 8$
37. $\frac{n^2}{2}$
38. $\frac{n^2}{3} + 9$
39. $n^2 + n + 1$
40. $2n^2 + 2n + 1$
41. $n^2 + 6n$
42. $n^2 - 2n + 1$
43. $3n^2 + 4n - 12$