The Nth Term of a Quadratic Sequence

Grade 8/9 topic · Higher tier · Edexcel and AQA

How to use this pack
20 questions that get harder as you go. Questions 1–15 (53 marks) build up to the harder Grade 8–9 style questions at the end; aim to complete all 20. Show your working on the lines and write your final answer on the answer line, then mark yourself with the answers at the back. Diagrams are not drawn accurately. Total: 76 marks.

Warm-up

1 Here are the first five terms of a sequence: 5, 8, 15, 26, 41. Find the first differences. **[2 marks]**

Answer _____

2 Here are the first five terms of a sequence: 9, 25, 51, 87, 133. Find the second difference. **[2 marks]**

Answer _____

3 The nth term of a sequence is $n^2 + 5n + 6$. Work out the first three terms. **[2 marks]**

Answer _____

4 The nth term of a sequence is $3n^2 + n + 8$. Work out the 10th term. **[2 marks]**

Answer _____

5 Is the sequence 8, 25, 50, 83, 124 linear or quadratic? Explain. **[2 marks]**

Answer _____

Core

6 Find the nth term of the sequence 15, 33, 59, 93, 135. **[5 marks]**

Answer _____

7 Find the nth term of the quadratic sequence 6, 7, 10, 15, 22. **[5 marks]**

Answer _____

8 The nth term is $4n^2 + 3n + 3$. Work out the 20th term. **[3 marks]**

Answer _____

9 Find the nth term of 8, 27, 56, 95, 144. **[5 marks]**

Answer _____

10 The first five terms of a sequence are 17, 34, 59, 92, 133. Work out the 8th term. **[4 marks]**

Answer _____

Stretch

11 The nth term is $2n^2 + 8$. Is 208 a term in the sequence? Show your working. **[4 marks]**

Answer _____

12 The nth term is $n^2 + 3n + 8$. Which term of the sequence equals 78? **[4 marks]**

Answer _____

13 The nth term is $4n^2 - 3n - 1$. Work out the difference between the 10th and the 9th terms. **[4 marks]**

Answer _____

14 Is 525 a term of the sequence with nth term $4n^2 + 3n + 7$? Explain. **[5 marks]**

Answer _____

15 Find the first term of $4n^2 + 3n$ that is greater than 100. **[4 marks]**

Answer _____

Challenge

16 The nth term of a sequence is $4n^2 + 5n + 7$. Show that the second difference is 8. **[5 marks]**

Answer _____

17 A sequence has nth term $4n^2 + 5n + 1$. Find the sum of the first 5 terms. **[5 marks]**

Answer _____

18 The nth term of a quadratic sequence is $n^2 + 3n + 7$. The 3rd term is 25. Check this using $n = 3$. **[3 marks]**

Answer _____

19 A quadratic sequence has second difference 8, first term 15 and second term 32. Find the nth term. **[6 marks]**

Answer _____

20 A sequence has nth term $5n^2 - 4n - 4$. Find the position of the first term above 200? **[4 marks]**

Answer _____