Name:

# Exam Style Questions

## Quadratic Sequences

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

**Guidance**

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

## Revision for this topic

www.corbettmaths.com/contents

Video 388

1. The first four terms of a quadratic sequence are shown below
Work out the next term.

7 11 17 25
4 6 8 10

35

**(2)**

2. The first four terms of a quadratic sequence are shown below
Work out the next term.

6 12 22 36
6 10 14 18

54

**(2)**

3. The $n^{th}$ term of a quadratic sequence is $n^2 - 2n + 8$

Work out the first three terms of this sequence

1st term $1^2 - 2 \times 1 + 8$

2nd term $2^2 - 2 \times 2 + 8$

3rd term $3^2 - 2 \times 3 + 8$

7 8 11

**(2)**

4. A quadratic sequence has an $n^{th}$ term of $2n^2 + 3n - 1$

Work out the value of the 6th term of the sequence

$2 \times 6^2 + 3 \times 6 - 1$

$72 + 18 - 1$

89

**(2)**

5. A sequence has an $n^{th}$ term of $n^2 - 6n + 7$

Work out which term in the sequence has a value of 23.

$n^2 - 6n + 7 = 23$

$n^2 - 6n - 16 = 0$

$(n - 8)(n + 2) = 0$

$n = 8$ ✓ $\quad n = -2$ ✗

$n = 8^{th}$ term

**(2)**

6. Here are the first 5 terms of a quadratic sequence

4 11 20 31 44

Find an expression, in terms of n, for the nth term of this quadratic sequence.

| | | | | |
|---|---|---|---|---|
| $a+b+c$ (4) | 11 | 20 | 31 | 44 |
| $3a+b$ (7) | 9 | 11 | 13 | |
| $2a$ (2) | 2 | 2 | | |

$a = 1 \quad b = 4 \quad c = -1$

$n^2 + 4n - 1$

**(3)**

7. Here are the first 5 terms of a quadratic sequence

4 10 18 28 40

Find an expression, in terms of n, for the nth term of this quadratic sequence.

| | | | | |
|---|---|---|---|---|
| $a+b+c$ (4) | 10 | 18 | 28 | 40 |
| $3a+b$ (6) | 8 | 10 | 12 | |
| $2a$ (2) | 2 | 2 | | |

$a = 1$

$b = 3$

$c = 0$

$a^2 + 3n$

**(3)**

8. Here are the first 5 terms of a quadratic sequence

9 17 29 45 65

Find an expression, in terms of n, for the nth term of this quadratic sequence.

a+b+c (9) 17 29 45 65

3a+b (8) 12 16 20

2a (4) 4 4

$a=2 \quad b=2 \quad c=5$

$2n^2+2n+5$

**(3)**

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9. Here is a tile.

Here is a sequence of patterns made from these tiles.

Pattern 1 Pattern 2 Pattern 3

1 7 19

How many of these tiles are needed to make Pattern number 10?

a+b+c (1) 7 19 37

3a+b (6) 12 18

2a (6) 6

$a=3 \quad b=-3 \quad c=1$

$3n^2-3n+1$

$3\times10^2-3\times10+1$

271

**(5)**

10. The nth term of a sequence is $n^2 + 3n$
Two consecutive terms in the sequence have a difference of 38

Work out the two terms.

$(n+1)^{th}$ term $(n+1)^2 + 3(n+1) = n^2 + 2n + 1 + 3n + 3 = n^2 + 5n + 4$

$n^{th}$ term $n^2 + 3n$

Difference $2n + 4$

$2n + 4 = 38$

$2n = 34$

$n = 17$

17 and 18

**(4)**

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11. Prove that every term in the sequence $n^2 - 4n + 21$ is positive

$(n-2)^2 - 4 + 21$

$(n-2)^2 + 17$

↑ always bigger than or equal to zero for any value of $n$.

when 17 is added, it will always be positive.

**(4)**