

GCSE Maths: Position-to-term rules (Higher): answers

GCSE Maths - Sequences and nth Term - Higher - Lesson 11.3

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch11-sequences/higher/position-to-term-rules/

Exercise 11C Position-to-term rules Non-calculator

1 Write down the first four terms of the sequence with each nth term.

(a) $3n + 1$

Answer: 4, 7, 10, 13

(b) $5n - 2$

Answer: 3, 8, 13, 18

(c) $4n + 3$

Answer: 7, 11, 15, 19

(d) $2n - 7$

Answer: -5, -3, -1, 1

(e) $10n + 5$

Answer: 15, 25, 35, 45

(f) $6n - 1$

Answer: 5, 11, 17, 23

2 Write down the first five terms of the sequence with each nth term.

(a) $20 - 3n$

Answer: 17, 14, 11, 8, 5

(b) $12 - 2n$

Answer: 10, 8, 6, 4, 2

(c) $50 - 10n$

Answer: 40, 30, 20, 10, 0

(d) $1 - n$

Answer: 0, -1, -2, -3, -4

3 Write down the first four terms of the sequence with each nth term.

(a) $n^2 + 1$

Answer: 2, 5, 10, 17

(b) $n^2 - 1$

Answer: 0, 3, 8, 15

(c) $2n^2$

Answer: 2, 8, 18, 32

(d) $3n^2 + 2$

Answer: 5, 14, 29, 50

(e) n^3

Answer: 1, 8, 27, 64

(f) 3^n

Answer: 3, 9, 27, 81

4 Work out the term asked for.

(a) The n th term is $4n + 7$. Find the 100th term.

Answer: 407

(b) The n th term is $3n - 5$. Find the 50th term.

Answer: 145

(c) The n th term is $9n + 4$. Find the 20th term.

Answer: 184

(d) The n th term is $100 - n$. Find the 60th term.

Answer: 40

(e) The n th term is $n^2 + 3$. Find the 12th term.

Answer: 147

(f) The n th term is $2n^2 + 1$. Find the 10th term.

Answer: 201

5 The n th term of a sequence is $3n - 2$. Work out the terms in positions 1, 2, 5 and 10.

Answer: 1, 4, 13, 28

6 A taxi charges a fixed £3 plus £2 for every mile. The cost, in pounds, of a journey of n miles is $2n + 3$.

(a) Work out the cost of a 7-mile journey.

Answer: £17

(b) Work out the cost of a 15-mile journey.

Answer: £33

(c) Work out the cost of a 40-mile journey.

Answer: £83

7 A gym charges £25 to join and then £15 a month. After n months the total cost in pounds is $15n + 25$. Work out the total cost after 12 months.

Answer: £205

- 8 Zoe says, "The 5th term of the sequence $2n^2$ is 100, because $2 \times 5 = 10$ and $10^2 = 100$." What mistake has she made, and what is the correct answer?

Answer: She squared 2×5 . The correct 5th term is $2 \times 25 = 50$.

- 9 Which of these is the n th term of the sequence 5, 8, 11, 14, ...? **A** $5n$ **B** $n + 4$ **C** $3n + 2$ **D** $3n + 5$. Show how you decide.

Answer: C: $3n + 2$

- 10 The n th term of one sequence is n^2 and the n th term of another is $11n$.

- (a) Which is bigger, the 10th term of n^2 or the 10th term of $11n$?

Answer: $11n$ is bigger (110 compared with 100)

- (b) Which is bigger, the 12th term of each?

Answer: n^2 is bigger (144 compared with 132)

- 11 A function machine does the following to the position number n : multiply by 4, then subtract 3, giving the term.



- (a) Write the n th term.

Answer: $4n - 3$

- (b) Work out the 6th term.

Answer: 21

- 12 The n th term of a sequence is $7n - 4$. Work out the **sum** of the 1st term and the 10th term.

Answer: 69

- 13 Write down the first five terms of the sequence with each n th term.

- (a) $n^2 - 3n + 5$

Answer: 3, 3, 5, 9, 15

- (b) $2n^2 + n - 1$

Answer: 2, 9, 20, 35, 54

- (c) $-n^2 + 10n$

Answer: 9, 16, 21, 24, 25

- (d) $n^2 + n$

Answer: 2, 6, 12, 20, 30

- 14 The n th term of a sequence is $n^2 - 6n + 10$. Show that the 2nd term and the 4th term are equal. Find another pair of equal terms.

Answer: The 2nd and 4th terms are both 2. The 1st and 5th terms are both 5.

