

GCSE Maths: Using the nth term (Higher): worksheet

GCSE Maths - Sequences and nth Term - Higher - Lesson 11.5

Name: _____

Date: _____

Score: _____

16 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch11-sequences/higher/using-the-nth-term/

Exercise 11E Using the nth term Non-calculator

1 The nth term of a sequence is $3n + 1$. Is each number a term of the sequence? If it is, say which term.

(a) 31

Answer:

(b) 50

Answer:

(c) 100

Answer:

(d) 151

Answer:

2 Is each number a term of the sequence given? Show how you decide.

(a) Is 100 in 7, 11, 15, 19, ...

Answer:

(b) Is 99 in 3, 9, 15, 21, ...

Answer:

(c) Is 61 in 2, 5, 8, 11, ...

Answer:

(d) Is 87 in 10, 15, 20, 25, ...

Answer:

3 The nth term of a sequence is $20 - 3n$. Is each number a term of the sequence?

(a) -10

Answer:

(b) -11

Answer:

(c) 2

Answer:

(d) 0

Answer:

4 Find the first term of each sequence that is greater than the given number.

(a) n th term $7n - 4$; greater than 100

Answer:

(b) n th term $4n + 1$; greater than 250

Answer:

(c) n th term $9n + 2$; greater than 500

Answer:

(d) n th term $2n + 5$; greater than 1000

Answer:

5 The n th term of each sequence is given. Find the first term that is less than 0.

(a) n th term $50 - 3n$

Answer:

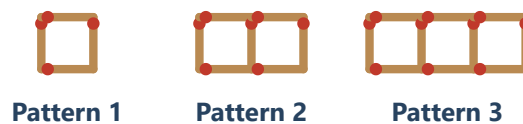
(b) n th term $42 - 5n$

Answer:

(c) n th term $100 - 7n$

Answer:

6 Here are the first three patterns made from matchsticks.



(a) Find the n th term.

Answer:

(b) How many matchsticks are needed for pattern 50?

Answer:

7 Here are the first three patterns of triangles made from matchsticks.



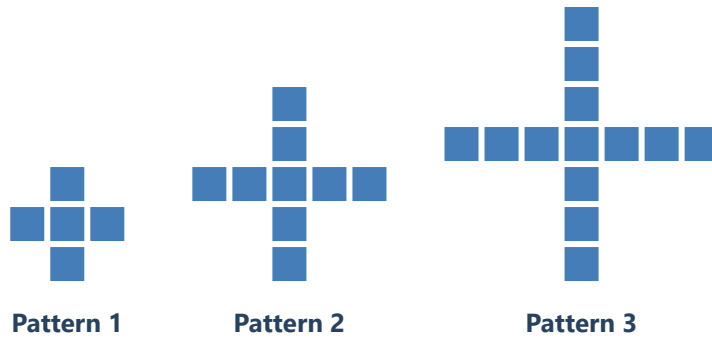
(a) Find the n th term.

Answer:

(b) Which pattern uses exactly 71 matchsticks?

Answer:

8 Here are the first three tile patterns.



(a) Find the n th term.

Answer:

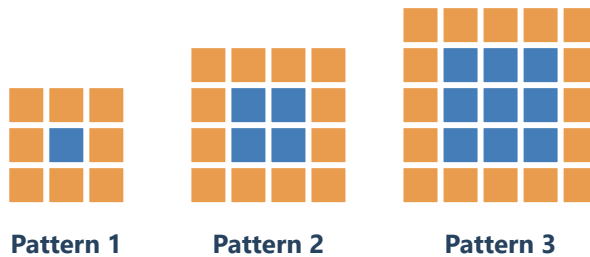
(b) How many tiles are in pattern 20?

Answer:

(c) Which pattern has 101 tiles?

Answer:

- 9 A square pond is surrounded by a border of paving slabs. Here are the first three patterns, with the pond in blue and the slabs in orange.



(a) Find the n th term for the number of slabs.

Answer:

(b) How many slabs are needed to go round a pond that is 25 slabs wide (pattern 25)?

Answer:

- 10 A taxi company charges £3 plus £2 for each mile. The cost, in pounds, of a journey of n miles is $2n + 3$. Could a journey cost exactly the amount below? If so, how many miles was it?

(a) £47

Answer:

(b) £50

Answer:

- 11 Tables are pushed together in a row. A row of n tables seats $4n + 2$ people. A club wants every seat to be taken. Could it be done with exactly this many people? If so, how many tables?

(a) 100 people

Answer:

(b) 102 people

Answer:

- 12 The n th term of a sequence is $11n + 5$. Find the largest term of the sequence that is less than 300.

Answer:

- 13** The n th term of a sequence is $6n - 2$. Explain why none of the terms is a multiple of 3.

Answer:

- 14** Find the n th term of each arithmetic sequence from the two terms given.

- (a) The 3rd term is 11 and the 7th term is 27

Answer:

- (b) The 2nd term is 5 and the 6th term is 21

Answer:

- (c) The 4th term is 20 and the 9th term is 5

Answer:

- (d) The 5th term is 12 and the 8th term is 21

Answer:

- 15** For each pair of sequences, find the position where they have the same term, or show that there is no such position.

- (a) $5n + 3$ and $8n - 12$

Answer:

- (b) $4n + 1$ and $6n - 5$

Answer:

- (c) $3n + 7$ and $5n + 2$

Answer:

- 16** The n th term of a sequence is $2n + 1$. Explain why every term is an odd number. Hence show that no pattern of triangles made from matchsticks (3, 5, 7, 9, ... matchsticks) can use exactly 100 matchsticks.

Answer: