2.15 Linear Sequences and the nth Term: 30-minute Pack

Calculators not allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Here are the first five terms of an arithmetic sequence.
5, 10, 15, 20, 25
Find an expression for the nth term.

(2)

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2 The nth term of a sequence is 3n - 5.
Work out the 22nd term.

(2)

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3 A pattern uses 5 tiles in pattern number 1, 9 in pattern number 2 and 13 in pattern number 3, and continues in the same way.
Which pattern number uses 161 tiles?

(3)

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4 Mo says that 224 is in the sequence with nth term 7n + 4. Is Mo correct? Explain your answer.

(3)

5 For each sequence, find an expression for the nth term in the form an + b.

(a) Sequence: 5, 8, 11, 14, ... **(1)**

(b) Sequence: 12, 9, 6, 3, ... **(1)**

(c) Sequence: 7, 11, 15, 19, ... **(2)**

6 The nth term of a sequence is 2n + 8.
Is 48 a term of this sequence? Show your working.

(3)

7 Find n when the nth term equals 41 for the sequence with nth term 5n - 4.

(3)

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8 Given the nth term 3n + 8, find the 6th term.

(1)

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9 A gardener plants tulip bulbs in rows. The first row has 9 bulbs and each row after has 5 more bulbs than the previous row, so the nth row has nth term 5n + 4 bulbs. On which row will she first plant at least 54 bulbs in that single row?

(3)

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Mark scheme · 2.15 Linear Sequences and the nth Term: 30-minute Pack

Question 1

common difference 5 identified (or 5n in the expression)	M1
5n cao	A1

Answer: **nth term = 5n**

Question 2

substitutes n = 22: 3 x 22 - 5	M1
61 cao	A1

Answer: **61**

Question 3

nth term 4n + 1	M1
4n + 1 = 161	M1
pattern number 40 cao	A1

Answer: **pattern number 40**

Question 4

7n + 4 = 224 written down	M1
n = 220/7 or a clear check that the terms are 221 and 228	M1
No, with a correct explanation	A1

Answer: **No, Mo is not correct**

Question 5

(a) 3n + 2 cao	B1

(a) Answer: **3n + 2**

(b) -3n + 15 cao	B1

(b) Answer: **-3n + 15**

(c) common difference 4 identified, so a = 4	M1
(c) 4n + 3 cao	A1

(c) Answer: **4n + 3**

Question 6

2n + 8 = 48 written as an equation	M1
solves to get n = 20	M1
Yes, it is the 20th term	A1

Answer: **Yes, it is the 20th term**

Question 7

set up equation 5n - 4 = 41 or 5n = 45	M1
divide both sides by 5 or perform correct arithmetic to get n = 9	M1
n = 9 cao	A1

Answer: **n = 9**

Question 8

26 cao	B1

Answer: **26**

Question 9

sets up 5n + 4 ≥ 54	M1
correct rearrangement, e.g. n ≥ 10	M1
row 10 cao	A1

Answer: **Row 10**

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