



## EP.M130 Sequences: Term-to-Term and Position-to-Term

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 55 minutes

Total Marks

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Name: \_\_\_\_\_ Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

**Answer ALL questions. Show all your working.**

**1** Find the next number in the sequence: 4, 9, 14, 19, \_\_\_\_

- ☐ A) 20
- ☐ B) 24
- ☐ C) 23
- ☐ D) 29
- ☐ E) 22

(Total for Question 1 is 1 mark)

**2** Describe the rule for the sequence: 12, 9, 6, 3, 0,...

(Total for Question 2 is 1 mark)

**3** Continue this sequence:  $3/2$ , 2,  $5/2$ , 3, \_\_\_\_, \_\_\_\_

(Total for Question 3 is 2 marks)

**4** The  $n$ th term of a sequence is  $a_n = 5n - 2$ . What is the 10th term?

- ☐ A) 50
- ☐ B) 48
- ☐ C) 45
- ☐ D) 52
- ☐ E) 47

(Total for Question 4 is 1 mark)

5 Find the term-to-term rule for this sequence: 2, 6, 18, 54,...

(Total for Question 5 is 1 mark)

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6 The  $n$ th term of a sequence is  $a_n = 3n^2 - n$ .

(a) Find  $a_4$ . (1)

(b) Find  $a_{10}$ . (1)

(Total for Question 6 is 2 marks)

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7 The  $n$ th term of a sequence is  $a_n = 7n - 5$ . Find the 100th term.

(Total for Question 7 is 2 marks)

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8 Which term of the sequence with  $n$ th term  $a_n = 2n + 1$  has value 101?

(Total for Question 8 is 2 marks)

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9 The sequence 1, 4, 9, 16,... is made from an  $n$ th-term rule. What is the 15th term?

- ☐ A) 210
- ☐ B) 225
- ☐ C) 240
- ☐ D) 256
- ☐ E) 221

(Total for Question 9 is 1 mark)

**10** The  $n$ th term of a sequence is  $a_n = 4 - 3n$ . Find  $a_{50}$ .

(Total for Question 10 is 2 marks)

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**11** The sequence is 10, 7, 11, 8, 12, 9,... Find the 8th term.

(Total for Question 11 is 2 marks)

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**12** The  $n$ th term of a sequence is  $a_n = \frac{1}{2}n^2 + \frac{3}{2}n$ . Find  $a_{25}$ .

(Total for Question 12 is 3 marks)

# Mark scheme · EP.M130 Sequences: Term-to-Term and Position-to-Term

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## Question 1

- **B1** correct option B (24) cao
- **Answer: B) 24** (sequence increases by 5 each time:  $19 + 5 = 24$ ).

## Question 2

- **B1** "subtract 3" or "decrease by 3 each time" cao
- **Answer: Subtract 3 each time.**

## Question 3

- **M1** identify the step change  $+1/2$  (difference between consecutive terms) seen
- **A1** correct next two terms  $7/2, 4$  cao
- **Answer:  $7/2, 4$**

## Question 4

- **B1** correct option B (48) cao
- **Answer: B) 48**

## Question 5

- **B1** multiply by 3 each time ("times 3" or "multiply by 3") cao
- **Answer: Multiply by 3 each time.**

## Question 6

- (a) **B1**  $a_4 = 3(4^2) - 4 = 48 - 4 = 44$  cao
- (a) **Answer: 44**
- (b) **B1**  $a_{10} = 3(10^2) - 10 = 300 - 10 = 290$  cao
- (b) **Answer: 290**

## Question 7

- **M1** substitute  $n = 100$  into  $7n - 5$  seen ( $7 \times 100 - 5$ )
- **A1** 695 cao
- **Answer: 695**

## Question 8

- **M1** attempt to solve  $2n + 1 = 101$  ( $2n = 100$ ) seen
- **A1**  $n = 50$  cao
- **Answer: 50**

## Question 9

- **B1** correct option B (225) cao
- **Answer: B) 225**

## Question 10

- **M1** substitute  $n = 50$  to give  $4 - 3 \times 50$  seen
- **A1** -146 cao
- **Answer: -146**

## Question 11

- **M1** identify alternating rule  $(-3, +4)$  or equivalent pattern seen
- **A1** 8th term = 10 cao
- **Answer: 10**

### Question 12

- **M1** calculate  $n^2$  for  $n = 25$ :  $25^2 = 625$  seen
- **M1** calculate  $3n$  for  $n = 25$ :  $3 \times 25 = 75$  and form  $(625 + 75)$  seen
- **A1** 350 cao
- **Answer: 350**