2.28-2 Algebra, Sequences and Patterns Depth Set 2: 10-minute Pack

GL ASSESSMENT EP.M39 · Calculators not allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

Algebra, Sequences and Patterns Depth Set 2

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A second 11+ early-algebra and sequences paper for scholarship-level preparation, complementing EP.M13 (Sequences and Patterns), EP.M14 (Early Algebra) and EP.M28 (Algebra, Sequences and Patterns Depth). It covers function machines, forming and simplifying expressions, one-step and two-step equations, term-to-term and position-to-term sequences, linear nth-term rules and pattern sequences, with an entirely fresh set of numbers and contexts. Questions are ramped from straightforward warm-up items to demanding multi-step and reverse-reasoning problems designed to stretch the strongest candidates.

1 Zara puts £9 into a money box in week 1. Each week after that, she adds £8 more, following the term-to-term rule 'add 8'. Write down the amount of money she has at the end of each of the first five weeks.

(2)

2 Mrs Boateng's class makes a pattern from hexagonal tiles for a wall display. Pattern 1 uses 6 tiles, pattern 2 uses 10 tiles and pattern 3 uses 14 tiles. Each new pattern uses 4 more tiles than the last.

(a) Describe, in words, the term-to-term rule for the number of tiles. **(1)**

(b) How many tiles are needed for pattern 5? **(1)**

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3 Continue the pattern: 3, 9, 15, 21, ___

- ☐ A) 25
- ☐ B) 26
- ☐ C) 27
- ☐ D) 28
- ☐ E) 33

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4 A sequence begins 2, 8, 14, 20, ... Find the 10th term of the sequence. Show your working.

(2)

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5 Solve $4x + 3 = 27$. Show your working.

(2)

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6 Expand and simplify $3(x + 5) + 2$

(2)

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Mark scheme · 2.28-2 Algebra, Sequences and Patterns Depth Set 2: 10-minute Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

at least three consecutive correct terms (9, 17, 25, ...) **M1**

all five terms correct cao: 9, 17, 25, 33, 41 **A1**

Answer: £9, £17, £25, £33, £41

Question 2

(a) add 4 to the previous term each time oe **B1**

(a) Answer: Add 4 to the previous term each time (starting at 6).

(b) 22 cao **B1**

(b) Answer: 22

Question 3

C (27) cao **B1**

Answer: C) 27

Question 4

valid method, e.g. 2 + 9 x 6, or systematic continuation to the 10th term **M1**

56 cao **A1**

Answer: 56

Question 5

4x = 24 seen **M1**

x = 6 cao **A1**

Answer: x = 6

Question 6

correct expansion 3x + 15 seen **M1**

3x + 17 oe cao **A1**

Answer: 3x + 17

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