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

Total Marks

GL ASSESSMENT EP.M28 · Calculators not allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

Algebra, Sequences and Patterns Depth

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An 11+ early-algebra and sequences paper for scholarship-level preparation, complementing EP.M13 (Sequences and Patterns) and EP.M14 (Early Algebra). It covers function machines, missing-number problems, simple equations, term-to-term and position-to-term sequences, pattern continuation and formulae expressed in words. Questions are ramped from straightforward warm-up items to demanding multi-step and reverse-reasoning problems designed to stretch the strongest candidates.

1 Find the missing number: 5, 10, 15, ___, 25

- ☐ A) 18
- ☐ B) 20
- ☐ C) 22
- ☐ D) 25
- ☐ E) 30

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2 A function machine works like this: input, then subtract 5, then multiply by 2, to give the output.

(a) Find the output when the input is 9. **(1)**

.....

(b) Find the input when the output is 18. Show your working. **(2)**

.....

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3 A pattern of dots is drawn. Pattern 1 has 2 dots, pattern 2 has 5 dots and pattern 3 has 8 dots. Each new pattern has 3 more dots than the last.

(a) How many dots are in pattern 5? **(1)**

.....

(b) Which pattern number has exactly 29 dots? **(2)**

.....

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4 The nth term of a sequence is 4n - 2.

(a) Find the 6th term of the sequence. **(1)**

.....

(b) Find the 10th term of the sequence. **(1)**

.....

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5 Solve 3x + 2 = 17. Show your working.

(2)

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

Question 1

B (20) cao **B1**

Answer: B) 20

Question 2

(a) 8 cao **B1**

(a) Answer: 8

(b) correct reverse method: halve then add 5 oe **M1**

(b) 14 cao **A1**

(b) Answer: 14

Question 3

(a) 14 cao **B1**

(a) Answer: 14

(b) 3n - 1 = 29 set up, or equivalent correct method **M1**

(b) pattern 10 cao **A1**

(b) Answer: Pattern 10

Question 4

(a) 22 cao **B1**

(a) Answer: 22

(b) 38 cao **B1**

(b) Answer: 38

Question 5

3x = 15 seen **M1**

x = 5 cao **A1**

Answer: x = 5

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