6.2 Pre-Algebra and Sequences: Test Pack

National Curriculum (2014) Mathematics - KS2 Algebra (missing numbers, formulae, sequences) · Calculators not allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Find the missing number: 6 + ___ = 13

(1)

2 Find the missing number in each sentence.

(a) 14 + ___ = 22 **(1)**

(b) ___ - 15 = 9 **(1)**

3 Olivia writes a number sequence. It begins at 5, and the term-to-term rule is 'add 7 to the previous term'.

(a) Write the first five terms of the sequence. **(1)**

(b) Without writing out all the terms, explain how you could find the 25th term of the sequence, and use your method to find its value. **(3)**

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4 A taxi charges £3 to start and £6 for each mile. A journey is n miles long.

Write an expression for the total cost in pounds.

Answer: ___

(2)

---

5 Find the missing number in this sequence.

855, 845, 835, 825, 815, ___

Answer: ___

(1)

---

6 Mia has 17 more marbles than Hassan. Together they have 97 marbles.

How many marbles does Hassan have?

Answer: ___

(2)

---

7 Find the two missing terms in this sequence: 45, ___, 33, ___, 21

(2)

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8 A function machine adds 2.

The output is 20. What was the input?

Answer: ___

(1)

---

9 Two whole numbers have a sum of 20 and a product of 100.

What are the two numbers? Write the smaller one first.

Answer: ___ and ___

(2)

---

10 Find the missing number: (___ + 5) x 3 = 27

(2)

---

11 Matchsticks are used to make a row of pentagons joined side by side. One pentagon uses 5 sticks and each extra pentagon added needs 4 more sticks.

How many sticks are needed for 6 pentagons?

Answer: ___

(2)

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12 A pen costs 2p. Jack buys x pens.

Write an expression for the total cost in pence.

Answer: ___

(1)

13 The nth term of a sequence is 8n.

What is the 13th term?

Answer: ___

(2)

14 A function machine divides by 2 then multiplies by 9.

The output is 972. What was the input?

Answer: ___

(2)

15 Reece has 10 more marbles than Ravi. Together they have 78 marbles.

How many marbles does Ravi have?

Answer: ___

(2)

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16 a and b are positive whole numbers. a + b = 17 and a x b is less than 68.

How many pairs (a, b) with a smaller than b satisfy both conditions?

Answer: ___

(3)

---

17 Solve 2x - 14 = 12.

Answer: x = ___

(2)

---

18 Simplify a + 1a.

Answer: ___

(1)

---

19 a and b are positive whole numbers with a + b = 30.

How many different pairs (a, b) are there? Count (1, 29) and (29, 1) as different pairs.

Answer: ___

(2)

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20 Simplify 4x + 1 + x + 2.

Answer: ___

(2)

---

21 Two whole numbers have a sum of 10 and a product of 16.

What are the two numbers? Write the smaller one first.

Answer: ___ and ___

(2)

---

22 a and b are positive whole numbers with a + b = 27.

How many different pairs (a, b) are there? Count (1, 26) and (26, 1) as different pairs.

Answer: ___

(2)

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23 Matchsticks are used to make a row of squares joined side by side. One square uses 4 sticks and each extra square added needs 3 more sticks.

How many sticks are needed for 7 squares?

Answer: ___

(2)

---

24 The nth term of a sequence is 3n + 4.

What is the 25th term?

Answer: ___

(2)

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Mark scheme · 6.2 Pre-Algebra and Sequences: Test Pack

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

Question 1

7 cao — **B1**

Answer: **7**

Question 2

(a) 8 cao — **B1**

(a) Answer: **8**

(b) 24 cao — **B1**

(b) Answer: **24**

Question 3

(a) 5, 12, 19, 26, 33 all five correct cao — **B1**

(a) Answer: **5, 12, 19, 26, 33**

(b) correct method shown, e.g. 5 + 24 x 7 (oe) — **M1**

(b) 173 cao — **A1**

(b) clear explanation that the number of 'add 7' steps needed is one fewer than the term number (oe) — **B1**

(b) Answer: **173**

Question 4

one correct term — **M1**

6n + 3 cao — **A1**

Answer: **6n + 3**

Question 5

805 cao — **B1**

Answer: **805**

Question 6

97 - 17 = 80 seen — **M1**

40 cao — **A1**

Answer: **40**

Question 7

39 cao — **B1**

27 cao — **B1**

Answer: **39, 27**

Question 8

18 cao — **B1**

Answer: **18**

Question 9

tests pairs that add to the sum — **M1**

10 and 10 cao — **A1**

Answer: **10 and 10**

Question 10

27 / 3 (= 9) seen or implied — **M1**

4 cao — **A1**

Answer: **4**

Question 11

5 extra shapes seen — **M1**

25 cao — **A1**

Answer: **25**

Question 12

2x cao — **B1**

Answer: **2x**

Question 13

8 x 13 seen — **M1**

104 cao — **A1**

Answer: **104**

Question 14

uses the inverse operations in reverse order — **M1**

216 cao — **A1**

Answer: **216**

Question 15

78 - 10 = 68 seen — **M1**

34 cao — **A1**

Answer: **34**

Question 16

lists the pairs — **M1**

tests the product — **M1**

6 cao — **A1**

Answer: **6**

Question 17

adds or divides first — **M1**

x = 13 cao — **A1**

Answer: **x = 13**

Question 18

2a cao — **B1**

Answer: **2a**

Question 19

lists pairs systematically — **M1**

29 cao — **A1**

Answer: **29**

Question 20

collects the v terms or the numbers — **M1**

5x + 3 cao — **A1**

Answer: **5x + 3**

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Question 21

tests pairs that add to the sum	**M1**
2 and 8 cao	**A1**

Answer: **2 and 8**

Question 22

lists pairs systematically	**M1**
26 cao	**A1**

Answer: **26**

Question 23

6 extra shapes seen	**M1**
22 cao	**A1**

Answer: **22**

Question 24

3 x 25 seen	**M1**
79 cao	**A1**

Answer: **79**

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