Smart Cub Learning

11+ TOPIC PACK

Algebra and Sequences

Maths

60 questions from warm-up to exam level, with worked solutions

SAMPLE

Smart Cub Learning topic packs are original practice material. We are not affiliated with GL Assessment, CEM, Quest Assessments, Kent County Council or any school.

How to do it

Algebra uses letters to stand for numbers. A sequence is a list of numbers that follows a rule. In this book you will use letters and rules to find numbers you cannot just count to.

Learn the method

1. Read the question. Say out loud what you must find: a next term, a far term, or the value of an expression.
2. Find the rule. For a sequence, find the gap between neighbouring terms. For a letter, read what number it stands for.
3. Use the rule. Put the number in for the letter, or use the position in the rule. Do the steps in the order given.
4. If there are brackets, work out the brackets first, then multiply.
5. If there are two letters, put in each letter's number, multiply, then add.
6. Work it out in small steps on the page. Do not do it all in your head.
7. Check. Does your answer fit the pattern? Then pick the matching option.

Worked example 1

Theo writes down the first 4 terms of a number sequence. What is the next term?

Position	Value
Term 1	2
Term 2	7
Term 3	12
Term 4	17

A 22 **B** 12 **C** 27 **D** 17

How to work it out

1. The terms go up by 5 each time.
2. The next term is 17 + 5 = 22.

The answer is A: 22

Worked example 2

If n = 14, what is 9n + 5?

A 28 **B** 131 **C** 171 **D** 126

How to work it out

1. A number next to a letter means multiply, so 9n + 5 means 9 × n + 5.
2. Put 14 in place of n: 9 × 14 + 5.
3. Multiply first: 9 × 14 = 126.
4. Then add: 126 + 5 = 131.

The answer is B: 131

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Part 1 Warm up

15 questions. Circle the letter of your answer. Use spare paper for your working.

1 Zaid writes down the first 4 terms of a number sequence. What is the next term?

Position	Value
Term 1	1
Term 2	5
Term 3	9
Term 4	13

A 21 **B** 17

C 13 **D** 9

2 Priya writes down the first 4 terms of a number sequence. What is the next term?

Position	Value
Term 1	12
Term 2	22
Term 3	32
Term 4	42

A 42 **B** 62

C 52 **D** 32

3 Maya writes down the first 4 terms of a number sequence. What is the next term?

Position	Value
Term 1	12
Term 2	14
Term 3	16
Term 4	18

A 18 **B** 16

C 22 **D** 20

4 Rosa writes down the first 4 terms of a number sequence. What is the next term?

Position	Value
Term 1	8
Term 2	11
Term 3	14
Term 4	17

A 17 **B** 23

C 14 **D** 20

5 Theo writes down the first 4 terms of a number sequence. What is the next term?

Position	Value
Term 1	9
Term 2	14
Term 3	19
Term 4	24

A 24 **B** 34

C 29 **D** 19

6 If n = 9, what is 4n + 2?

A 38 **B** 15

C 42 **D** 44

7 If n = 6, what is 7n + 5?

A 81 **B** 54

C 77 **D** 47

8 If n = 5, what is 2n + 7?

A 14 **B** 3

C 17 **D** 15

9 If n = 12, what is 9n + 6?

A 108 **B** 162

C 27 **D** 114

10 If n = 5, what is 5n + 3?

A 13 **B** 28

C 22 **D** 40

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28 Ivy writes down the first 4 terms of a number sequence. What is term 14?

Position	Value
Term 1	5
Term 2	11
Term 3	17
Term 4	23

A 89 **B** 84
C 83 **D** 77

29 Zaid writes down the first 4 terms of a number sequence. What is term 9?

Position	Value
Term 1	9
Term 2	17
Term 3	25
Term 4	33

A 73 **B** 81
C 65 **D** 72

30 Omar writes down the first 4 terms of a number sequence. What is term 12?

Position	Value
Term 1	11
Term 2	18
Term 3	25
Term 4	32

A 81 **B** 84 **C** 88 **D** 95

Score: _____ / 15

Part 3 Stretch

15 questions. Circle the letter of your answer. Use spare paper for your working.

31 Zaid writes down the first 5 terms of a number sequence. What is the next term?

Position	Value
Term 1	48
Term 2	57
Term 3	66
Term 4	75
Term 5	84

A 93 **B** 75
C 84 **D** 102

32 Ivy writes down the first 5 terms of a number sequence. What is the next term?

Position	Value
Term 1	22
Term 2	37
Term 3	52
Term 4	67
Term 5	82

A 97 **B** 82
C 67 **D** 112

33 If n = 5, what is 4(n + 8)?

A 28 **B** 52
C 37 **D** 17

34 If n = 7, what is 2(n + 7)?

A 28 **B** 30
C 63 **D** 98

35 If n = 12, what is 2(n + 9)?

A 216 **B** 132
C 42 **D** 252

36 If n = 8, what is 5(n + 9)?

A 45 **B** 80
C 49 **D** 85

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