

GCSE Maths: Sequences and term-to-term rules (Higher): answers

GCSE Maths - Sequences and nth Term - Higher - Lesson 11.1

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch11-sequences/higher/sequences-and-term-to-term-rules/

Exercise 11A Term-to-term rules

Non-calculator

1 Write down the **next two terms** of each sequence.

(a) 4, 7, 10, 13, ...

Answer: 16, 19

(b) 30, 26, 22, 18, ...

Answer: 14, 10

(c) 5, 10, 20, 40, ...

Answer: 80, 160

(d) 64, 32, 16, 8, ...

Answer: 4, 2

(e) 1, 2, 4, 7, 11, ...

Answer: 16, 22

(f) 0.5, 1.2, 1.9, 2.6, ...

Answer: 3.3, 4

2 Describe the term-to-term rule of each sequence in words.

(a) 6, 11, 16, 21, ...

Answer: add 5

(b) 100, 93, 86, 79, ...

Answer: subtract 7

(c) 3, 6, 12, 24, ...

Answer: multiply by 2

(d) 162, 54, 18, 6, ...

Answer: divide by 3

(e) 2.5, 3, 3.5, 4, ...

Answer: add $\frac{1}{2}$

(f) -4, -1, 2, 5, ...

Answer: add 3

3 The **first term** and the **term-to-term rule** of some sequences are given. Write down the first five terms of each.

(a) First term 4; rule: add 6

Answer: 4, 10, 16, 22, 28

(b) First term 100; rule: subtract 7

Answer: 100, 93, 86, 79, 72

(c) First term 3; rule: multiply by 2

Answer: 3, 6, 12, 24, 48

(d) First term 80; rule: divide by 2

Answer: 80, 40, 20, 10, 5

(e) First term 2; rule: multiply by 3 and then subtract 1

Answer: 2, 5, 14, 41, 122

(f) First term 1; rule: multiply by 2 and then add 3

Answer: 1, 5, 13, 29, 61

4 Sam has £8 in his money box in week 1. Each week he adds £5. How much does he have in week 6?

Answer: £33

5 Find the 10th term of the sequence 3, 8, 13, 18, ...

Answer: 48

6 Ali says, "The rule for 3, 6, 12, 24, ... is add 3." Explain why Ali is wrong.

Answer: The differences are 3, 6, 12: not the same. The rule is multiply by 2.

7 Find the missing numbers in each sequence.

(a) 5, ?, 17, 23, ?

Answer: 11, 29

(b) 100, 88, ?, 64, ?

Answer: 76, 52

(c) ?, 14, 21, ?, 35

Answer: 7, 28

(d) -12, ?, -4, 0, ?

Answer: -8, 4

8 Write down the next two terms of each sequence.

(a) $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, ...

Answer: $\frac{5}{4}$, $\frac{3}{2}$

(b) $\frac{1}{2}, 1, \frac{3}{2}, 2, \dots$

Answer: $\frac{5}{2}, 3$

(c) $8, 5, 2, -1, \dots$

Answer: $-4, -7$

(d) $-20, -15, -10, -5, \dots$

Answer: $0, 5$

- 9 Freya says the next term in the sequence $1, 2, 4, 7, 11, \dots$ is 15 because “the last difference was 4, so add 4 again”. Is she right? Explain.

Answer: No. The differences go up by 1 each time, so the next difference is 5 and the next term is 16.

- 10 A tank holds 640 litres at the start. Each day half of the water is used. Term 1 is the amount at the start, term 2 is the amount after 1 day, and so on. How much water is left after 4 days?

Answer: 40 litres

- 11 The first term of a sequence is 5. The rule is “multiply by 2 and then subtract 3”. Work out the 7th term.

Answer: 131

- 12 The first term of a sequence is 2 and the rule is “multiply by 2 and then subtract 1”. Work out the first term that is bigger than 1000.

Answer: 1025 (the 11th term)