

Exercise walk-through

Change in Arithmetic and Geometric Sequences ■ 2.1

eXercise

You must be able to

- use the **common difference** 公差 of an arithmetic sequence
- use the **common ratio** 公比 of a geometric sequence
- write the n -th term of each

Method — Arithmetic sequences

A constant **common difference** d is added each step: $a_n = a_1 + (n - 1)d$.

Method — Geometric sequences

A constant **common ratio** r is multiplied each step: $g_n = g_1 \cdot r^{n-1}$.

Method — Example

$3, 7, 11, 15, \dots$ has $d = 4$; $2, 6, 18, 54, \dots$ has $r = 3$.

Practice 2.1 ■ 1 mark

State the common difference of $3, 7, 11, 15, \dots$

Solution 2.1

Method: Arithmetic sequences

Worked steps

$$d = 4 \quad \text{B1}.$$

Practice 2.2 ■ 1 mark

State the common ratio of $2, 6, 18, 54, \dots$

Solution 2.2

Method: Geometric sequences

Worked steps

$$r = 3 \quad \text{B1}.$$

Practice 2.3 ■ 2 marks

Find the 5-th term of an arithmetic sequence with $a_1 = 4$, $d = 3$.

Solution 2.3

Worked steps

$$a_5 = 4 + (5 - 1)(3) = 4 + 12 = 16 \quad \text{M1 A1}.$$

Exam-style 3.1 ■ 1 mark

An arithmetic sequence has a constant

- A** ratio
- B** difference
- C** product
- D** sum

Solution 3.1

Method: Arithmetic sequences

A ratio

B difference



C product

D sum

Worked steps

B.

Exam-style 3.2 ■ 1 mark

A geometric sequence has a constant

A difference

B ratio

C sum

D second difference

Solution 3.2

Method: Geometric sequences

A difference

B ratio



C sum

D second difference

Worked steps

B.

Exam-style 3.3 ■ 1 mark

A geometric sequence has $g_1 = 5$ and $r = 2$.

- (a) State the 2nd term.
- (b) State the 3rd term.
- (c) Write the formula for g_n .

Solution 3.3

Worked steps

(a) 10 **B1**. (b) 20 **B1**. (c) $g_n = 5 \cdot 2^{n-1}$ **B1**.