

2.6 Sequences

Name: _____ Class: _____ Date: _____ **Total: 22 marks**

KEY WORDS quadratic sequence

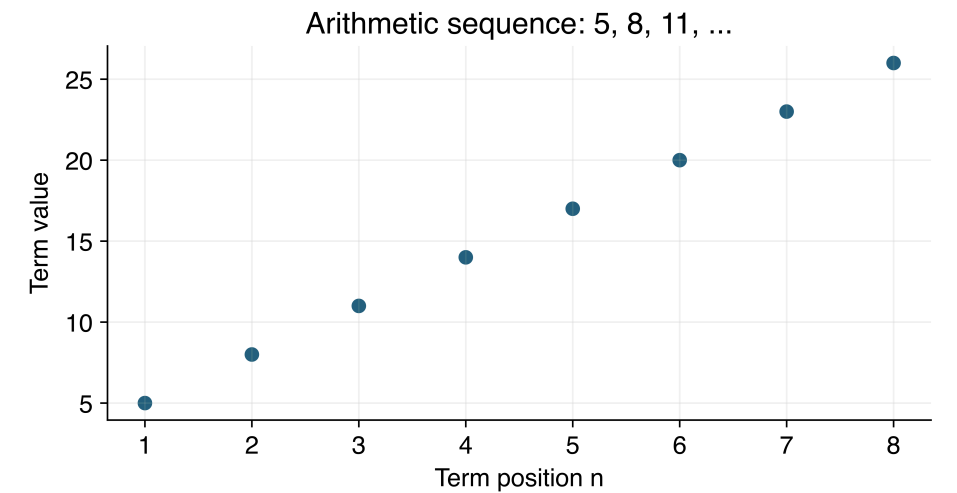
Sequences

Objective

Generate sequences from term-to-term and position-to-term rules; use triangular, square and cube sequences; find linear and quadratic n th terms (rows A24–A26 with the Extension quadratic-sequence addition).

1 Key knowledge and worked examples

n th terms. Arithmetic: $an + b$. Quadratic (Extension): second differences constant; $a = \frac{1}{2}$ (second difference). For 5, 9, 17, 29, 45: differences 4, 8, 12, 16, second difference 4, so $a = 2$; subtracting $2n^2$ leaves 3, 1, -1 , -3 , $-5 = -2n + 5$: n th term $2n^2 - 2n + 5$.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 Write the next two terms of 5, 9, 17, 29, 45, ... [2]

2.2 Find the n th term of 4, 7, 12, 19, 28, ... [3]

2.3 Find the n th term of 6, 11, 18, 27, 38, ... [3]

2.4 Which square number follows 144? [1]

3 Exam-style questions

3.1 (Original, quadratic-sequence family.) A sequence has n th term $3n^2 - 2n$. (a) Write down the first four terms. (b) Which term of the sequence equals 133? [4]

3.2 (*Original.*) The first differences of a sequence are 5, 9, 13, 17, ... (a) Find the next two differences. (b) Given the first term is 3, write the first four terms. (c) Find the n th term. [5]

3.3 (*Original, specification line not sampled: variation.*) y varies directly as the square of x ; $y = 48$ when $x = 4$. (a) Find the equation. (b) Find y when $x = 7$. [4]
