Arithmetic sequences

Name _____ Date _____

Key ideas

An arithmetic sequence changes by a fixed amount d. If a is the first term, term n is a + (n − 1)d. The number of steps between term positions determines how often the difference is added.

Worked examples

Find term 8 of 6, 10, 14, …

The difference is 4. Seven steps follow the first term, so term 8 = 6 + 7 × 4 = 34.

Term 3 is 13 and term 7 is 29. Find the first term.

The four steps from term 3 to term 7 total 16, so d = 4. Subtract two steps from 13 to get a = 5.

Practice questions

Show your reasoning. Each question is worth 2 marks.

1. Find the next two terms of 11, 16, 21, 26, … and state the common difference.

2. Find the next two terms of 44, 38, 32, … and state the common difference.

3. Start at 7 and add 3 at each step. Write the first four terms.

4. Find the twelfth term of 9, 13, 17, … and show your calculation.

5. Write an expression for term n of 14, 11, 8, …

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6. Which term of 3, 10, 17, … is 73? Show your working.

7. The first row of a hall has 19 seats. Every later row has four more. How many seats are in row 15?

8. Terms 5 and 12 are 23 and 58. Find the first term and common difference.

9. Determine whether 94 belongs to the sequence 5, 13, 21, … Explain.

10. A decreasing sequence has term 4 equal to 31 and term 10 equal to 7. Find the first negative term.