Mathematics · Algebra · Worked solutions

Arithmetic sequences

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

The common difference is 5. The next terms are 31 and 36.

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

The difference is −6. The next terms are 26 and 20.

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

Start with 7, then add 3 each time: 7, 10, 13, 16.

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

The difference is 4. Term 12 = 9 + 11 × 4 = 53.

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

14 − 3(n − 1), which simplifies to 17 − 3n.

Worked solutions · Questions 6–10

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

3 + 7(n − 1) = 73. Hence n − 1 = 10 and it is term 11.

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

Row 15 follows 14 increases: 19 + 14 × 4 = 75 seats.

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

Seven steps add 35, so d = 5. Term 1 = 23 − 4 × 5 = 3.

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

94 − 5 = 89, which is not a multiple of 8. Therefore no whole term position produces 94.

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

d = (7 − 31)/6 = −4. The first term is 43. Term 11 = 3 and term 12 = −1, so term 12 is the first negative term.