# Patterns and algorithms - topic test

12 questions | 21 marks | 30 minutes

Number rules, ordered steps, decisions and explained predictions.

Equivalent correct methods earn the corresponding marks.

**1.** The rule is add 4. Continue 3, 7, 11 with two terms. [2 marks]

11 + 4 = 15; 15 + 4 = 19.

**Answer:** 15, 19

**2.** The rule is multiply by 2. Fill 5, 10, __, 40. [1 mark]

10 × 2 = 20; 20 × 2 = 40.

**Answer:** 20

**3.** Start at 35 and subtract 6 each time. Write four terms. [2 marks]

35 − 6 = 29; 29 − 6 = 23; 23 − 6 = 17.

**Answer:** 35, 29, 23, 17

**4.** Give a simple constant-multiplication rule for 3, 9, 27, 81. [1 mark]

Each term is three times its predecessor.

**Answer:** Multiply by 3.

**5.** Start at 7. Add 5, then double. [2 marks]

7 + 5 = 12; 12 × 2 = 24.

**Answer:** 24

**6.** Start at 7. Double, then add 5. [2 marks]

7 × 2 = 14; 14 + 5 = 19.

**Answer:** 19

**7.** If the input is even, halve it; otherwise add 3. Use input 14. [1 mark]

14 is even, so 14 ÷ 2 = 7.

**Answer:** 7

**8.** If the input is even, halve it; otherwise add 3. Use input 9. [1 mark]

9 is odd, so 9 + 3 = 12.

**Answer:** 12

**9.** Start at 2. Add 4 repeatedly. Stop when the result is greater than 14. Give the final number. [2 marks]

2, 6, 10, 14, 18.

14 is not greater than 14.

**Answer:** 18

**10.** A display has 5 tiles at step 1 and gains 3 each step. Find step 5. [2 marks]

There are four jumps.

5 + 4 × 3 = 17.

**Answer:** 17 tiles

**11.** A learner says 12, 17, 22, 28 uses add 5. Identify the error and correct the fourth term. [2 marks]

The last jump adds 6.

22 + 5 = 27.

**Answer:** The fourth term should be 27.

**12.** A club starts with 12 dollars and saves 8 each week. It needs 60 dollars. How many weeks are needed? Explain. [3 marks]

60 − 12 = 48 dollars more are needed.

48 ÷ 8 = 6 weeks.

12 + 6 × 8 = 60.

**Answer:** 6 weeks