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]

$10 \times 2 = 20;\ 20 \times 2 = 40.$

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]

$7 + 5 = 12;\ 12 \times 2 = 24.$

Answer: 24

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

$7 \times 2 = 14;\ 14 + 5 = 19.$

Answer: 19

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

14 is even, so $14 \div 2 = 7$.

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.

$5 + 4 \times 3 = 17$.

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.

$48 \div 8 = 6$ weeks.

$12 + 6 \times 8 = 60$.

Answer: 6 weeks