Year 6 Patterns and equations topic test

12 questions | 22 marks | 30 minutes

A hand-solvable review that builds from familiar skills to reasoning and practical applications.

Equivalent correct methods earn the corresponding marks.

1. Continue the constant-step pattern: 0.4,0.8,1.2,__ ,__. [2 marks]

Add 0.4 each time.

Answer: 1.6 and 2.0.

2. A pattern starts at 1/4 and increases by 1/4. Write its first five terms. [2 marks]

Keep adding a quarter across the whole.

Answer: 1/4,1/2,3/4,1,1 1/4.

3. Use “term number ×3, then add 2” to find term 7. [1 mark]

7×3+2=23.

Answer: 23.

4. The constant-step values for terms 1,2,3 are 8,12,16. Give a rule using the term number. [2 marks]

1×4+4=8; 2×4+4=12; 3×4+4=16.

Answer: Multiply the term number by 4, then add 4.

5. Calculate 9+2×5. [1 mark]

2×5=10; 9+10=19.

Answer: 19.

6. Calculate (9+2)×5. [1 mark]

9+2=11; 11×5=55.

Answer: 55.

7. Calculate $30 \div 5 \times 2$. [2 marks]

Read left to right: $30 \div 5 = 6$; $6 \times 2 = 12$.

Answer: 12.

8. Find the missing number: $\square - 14 = 27$. [1 mark]

$27 + 14 = 41$; check $41 - 14 = 27$.

Answer: 41.

9. A number is multiplied by 5 and then 2 is added. The result is 37. Find the number. [2 marks]

$37 - 2 = 35$; $35 \div 5 = 7$.

Answer: 7.

10. Start at 0.5, record it, and add 0.5 each time. Stop after recording four terms. Write the output. [2 marks]

The start is the first recorded term.

Answer: 0.5,1,1.5,2.

11. A tile design has 6 tiles at stage 1 and adds 4 tiles at every new stage. How many tiles are at stage 10? Explain. [3 marks]

There are nine increases: $6 + 9 \times 4 = 42$.

Answer: 42 tiles.

12. An algorithm starts at 3 and adds 4 until the value is exactly 20. Explain why it fails and suggest a clear stopping rule. [3 marks]

The stopping condition must be tested on the values generated.

Answer: It gives 3,7,11,15,19,23,... and never reaches 20. One repair is to record values while they are at most 20, then stop before 23.