Year 4 Olympiad Mathematics

Challenge problems that reward strategy and explanation

Student: _____ Date: _____

Suggested time: 40–55 minutes. Show your thinking. You may ask an adult to read instructions, but try the questions independently.

Patterns and number reasoning

1. Find the next two numbers: 2, 5, 11, 23, 47, __, __. Explain the rule.

2. A two-digit number has digits adding to 11. Reversing the digits makes the number 27 greater. What is the original number?

3. Place + or − between 9, 8, 7 and 6 (in that order) to make 10. Can you do it?

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Logic and strategy

1. Three boxes are labelled Apples, Oranges and Mixed. Every label is wrong. You may take one fruit from one box without looking. Which box should you choose to work out all the labels? Explain.

2. Four friends each shake hands with every other friend once. How many handshakes happen? Show a diagram.

3. There are 12 coins and one is lighter. With a balance scale, can you identify it in at most 3 weighings? Describe a strategy.

Visual and combinatorial thinking

1. How many different rectangles can you make using exactly 24 square tiles, with whole-number side lengths? Count rotated rectangles only once.

2. A robot starts at (0,0) and moves only right or up to (2,2), one unit at a time. How many different shortest routes are possible?

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3. You have 3 red, 2 blue and 1 green counters in a bag. What is the smallest number you must take without looking to guarantee two counters of the same colour? Explain.

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How to use this assessment

Allow a quiet, relaxed sitting with breaks. Avoid giving the answer. Record whether responses were independent, prompted, or supported. This is a learning snapshot, not a fixed ability label.

Solutions and explanations

1. Double then add 1: 95, 191. 2. Original number 47: 74 − 47 = 27. 3. There is no solution using only + and −. Check the eight possible sign combinations systematically; none totals 10.

4. Choose the box labelled Mixed, because it cannot be mixed; identify its single fruit, then deduce the other two. 5. 6 handshakes: 4 × 3 / 2. 6. Divide into 3 groups of 4; weigh 4 vs 4, then identify the lighter group; weigh 2 vs 2, then 1 vs 1.

7. Four rectangles: 1×24, 2×12, 3×8, 4×6. 8. Six routes (arrangements of R,R,U,U). 9. Four counters, since three could be one of each colour.

Scoring approach

Prioritise reasoning, diagrams, persistence and clear explanation over speed. Award credit for partial strategies even when the final answer is wrong.

Question 3 intentionally has no solution; spotting and proving this is a valid mathematical outcome.

Follow-up ideas

Explore systematic listing, parity, tables, tree diagrams and working backwards.

Observation notes

Strengths: _____

Next steps: _____

Student explanations or questions worth revisiting: _____

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