Max the Monkey’s Geometry Challenge

Learning objective: To identify, describe, and represent the position of a shape following a reflection or translation, and to calculate missing angles in triangles and quadrilaterals.

Help Max solve these geometry puzzles. Use your knowledge of coordinates, symmetry, and angle properties to complete the tasks.

Max the monkey is organising his jungle maths club. He needs to move his shape diagrams across a grid and ensure all his angles add up correctly for his geometric display.

Word bank: reflection · translation · coordinate · quadrilateral · interior angle · symmetry · x-axis · y-axis

1. A triangle has vertices at (2, 3), (2, 6), and (5, 3). If Max translates this triangle 4 units to the right and 2 units down, what are the new coordinates of the vertices? (2 marks)

2. A quadrilateral has three angles measuring 75°, 110°, and 85°. Calculate the size of the fourth interior angle. Show your working. (2 marks)

3. Draw a square on a coordinate grid with one vertex at (1, 1). If you reflect this square across the y-axis, what happens to the x-coordinates of the vertices? Explain your reasoning. (3 marks)

4. Max has an isosceles triangle. The angle at the top (the apex) is 40°. Calculate the size of the two equal base angles. (2 marks)

5. If a shape is translated, does the size or orientation of the shape change? Explain why or why not. (2 marks)

Draw: Draw a Cartesian plane with an x-axis and y-axis ranging from 0 to 10. Plot a scalene triangle with vertices at (1, 2), (4, 2), and (2, 5). Label the coordinates clearly.

Extension challenge: Max wants to create a pattern by reflecting a shape across a diagonal line. Research or sketch what happens to the coordinates when a shape is reflected across the line y = x.