

Year 5 Mathematics: Navigating the Coordinate Plane

Learning objective: To identify, describe, and represent the position of a shape following a translation or reflection, and to plot coordinates in the first quadrant.

Read each question carefully. Max the monkey has provided a grid to help you calculate your answers. Show your working out clearly to gain full marks.

Max the monkey is helping his friends organise their woodland shop. He uses a coordinate grid to map out where items are placed. The 'x-axis' runs along the bottom, and the 'y-axis' runs up the side. The shop floor is a grid where every point is described by two numbers (x, y).

Word bank: x-axis · y-axis · coordinate · origin · translation · reflection · quadrant · horizontal · vertical

1. Max places a basket of apples at (2, 5) and a jar of honey at (7, 5). If he moves the basket 3 units to the right, what will its new coordinate be? Explain your reasoning. (2 marks)

2. A decorative rug is currently plotted at (1, 1), (1, 4), and (4, 1). If the rug is reflected across the vertical line $x = 6$, what are the new coordinates of the vertices? (3 marks)

3. Finn the dolphin is mapping a treasure chest. The chest is at (3, 8). He translates it 4 units down and 2 units right. Write the final coordinate and justify how you calculated the change in both the x and y positions. (4 marks)

4. Compare and contrast a translation and a reflection. In your answer, include what happens to the size and orientation of a shape in both scenarios. (4 marks)

5. Zara the zebra draws a square on a grid. Three of the vertices are (2, 2), (2, 6), and (6, 2). What is the coordinate of the fourth vertex? Calculate the area of this square if each unit represents £2 of floor space. (4 marks)

6. The shop is planning a redesign. A display case is located at (5, 5). If the display case is reflected across the y-axis, what might happen to its position? Is this possible on a standard first-quadrant grid? Justify your answer. (3 marks)

7. Write a short guide for a younger student explaining the 'Golden Rule' of coordinates: 'Along the corridor and up the stairs'. Include an example of how to plot a point at (4, 7). (5 marks)

Draw: Draw a 10x10 coordinate grid. Plot a triangle with vertices at (1, 2), (4, 2), and (2, 5). Label the x-axis and y-axis clearly.



Extension challenge: Total: /25. Creative Extension: Imagine the shop floor is a 10x10 grid. Design a layout for 5 different items. Write the coordinates for each item and create a 'translation challenge' for a partner to solve.