Grade 5 Math Assessment: Transformations and Coordinate Geometry

Learning objective: To describe positions and movements on a 2D grid, including reflections and translations, and to use coordinates to plot and transform shapes.

Read each question carefully. Use a ruler for drawing shapes. Ensure your answers are written clearly in the spaces provided. You have 30 minutes to complete this assessment.

Max the monkey is helping his friends organize a treasure hunt on a coordinate grid. He needs to move items to specific locations and reflect shapes to create patterns for the map. Help Max solve these spatial puzzles.

Word bank: Translation · Reflection · Vertex · Coordinate · Axis · Quadrant · Horizontal · Vertical · Symmetry

1. Max plots a point at (3, 2). He translates the point 4 units to the right and 3 units up. Write the new coordinates of the point. (2 marks)

2. A square has vertices at (1, 1), (1, 3), (3, 3) and (3, 1). If you reflect this square across the vertical axis (x=0), what will the new coordinates of the vertices be? (3 marks)

3. Describe the translation required to move a shape from coordinate (5, 6) to (2, 9). (3 marks)

4. Zara is drawing a symmetrical pattern. She draws a triangle with vertices at (2, 2), (2, 5) and (5, 2). Explain how you would reflect this triangle across the horizontal line y=6. (4 marks)

5. Max wants to move a chest of gold from (1, 1) to (8, 8). He can only move in two translations. Suggest two different translations he could use to reach the destination. (4 marks)

6. Extended Task: Design a 4-vertex polygon on a grid. Describe the shape's original coordinates, then write a step-by-step set of instructions for a friend to translate and reflect your shape. Explain how the coordinates change during each transformation. (9 marks)

Draw: On a 10x10 grid, plot a rectangle with vertices (2, 4), (2, 8), (6, 8) and (6, 4). Label this Shape A.

Extension challenge: Total: /25