



Instructions: No answer bank: show your working for the shape maths. Number the steps in order, answer the case study questions, explain the key terms, then write full-sentence answers and plan the extended answer.

1. Shape maths (show your working)

Question	Working and answer
Distance from $(-3, 5)$ to $(4, 5)$	
Area scale when lengths are tripled	
On a 1 : 25,000 map, 6 cm is how many metres?	
Order of rotational symmetry of a regular hexagon	
Reflect $(2, -7)$ in the x-axis: the new y-coordinate	

Did you know?

- Rotating 90° anticlockwise about the origin sends (x, y) to $(-y, x)$.
- Two reflections in parallel mirrors make a translation.
- Two reflections in crossing mirrors make a rotation.
- A shape enlarged by scale factor k has volume $k \times k \times k$ times bigger, if it is 3D.

Background

Two perpendicular number lines make a grid: the x-axis (across) and the y-axis (up). They cross at the origin $(0, 0)$. Every point has coordinates (x, y) : go across first, then up. A handy rhyme: 'along the corridor, then up the stairs'. Negative numbers go left or down, so the axes split the plane into four quadrants. The point $(-3, 2)$ is 3 left and 2 up.

2. Steps in order

Number the steps 1 to 5 (1 = first).

1	Go across: Move along the x-axis by the first number
2	Join: Join the points in order to make the shape
3	Go up or down: Move parallel to the y-axis by the second number
4	Start at origin: Begin at $(0, 0)$
5	Mark the point: Draw a small cross and label it

4. Key terms

Key term	What does it mean? Give an example.
Origin	
Coordinates	
Translation	
Reflection	
Rotation	

3. Case study

Tayo draws a kite with vertices $P(0, 4)$, $Q(2, 1)$, $R(0, -3)$, $S(-2, 1)$. He reflects it in the y-axis and is surprised it lands on itself.

Case study: Tayo's kite on a grid

1. Where does $Q(2, 1)$ go after reflecting in the y-axis?

2. Why does the kite land on itself?

3. Translate the kite 5 right. Give the new P.

5. Think it through

1. Explain why areas multiply by $k \times k$ in an enlargement.

2. Explain how to rotate a point 180° about the origin.

6. Longer answers (full sentences)

1. Plot and name the shape A(1, 1), B(5, 1), C(5, 4), D(1, 4).

2. Describe two different transformations that move (2, 3) to (−2, 3).

3. A map scale is 1 : 100,000. How far is 3.5 cm in real life?

4. Explain in your own words: Why is an enlargement not an isometry?

7. Extended answer

Extended answer: 'Transformations are just for maths lessons.' How far do you agree?

Plan: introduction · point for (example) · point against (example) · conclusion with your judgement.
