Sequences of transformations

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Reflect $(3, 2)$ in the x-axis, then move 1 left and 4 up. [2 marks]

Reflect to $(3, -2)$, then translate to $(2, 2)$.

Answer: $(2, 2)$

2. Move $(-2, 1)$ 3 right and 2 down, then reflect in the y-axis. [2 marks]

The first image is $(1, -1)$; the reflection gives $(-1, -1)$.

Answer: $(-1, -1)$

3. Reflect $(4, -1)$ in the x-axis and then in the y-axis. Give the final point and one equivalent rotation. [3 marks]

After x-axis reflection: $(4, 1)$.

After y-axis reflection: $(-4, 1)$.

Answer: $(-4, 1)$; a 180° turn about the origin.

4. Combine a move of 5 left and 2 up with a move of 3 right and 4 down. [2 marks]

Horizontal change: $-5 + 3 = -2$.

Vertical change: $2 - 4 = -2$.

Answer: 2 units left and 2 units down.

5. A point is reflected in the y-axis twice. Explain the final result. [2 marks]

The first reflection reverses x; the second reverses that sign again.

The y-coordinate never changes.

Answer: It returns to its original position.

6. Start at $(1, 2)$. Compare “move 2 up, then reflect in the x-axis” with “reflect in the x-axis, then move 2 up”. [3 marks]

First order: $(1, 2) \to (1, 4) \to (1, -4)$.

Reverse order: $(1, 2) \to (1, -2) \to (1, 0)$.

The final points differ.

Answer: First order: $(1, -4)$. Reverse order: $(1, 0)$.