Transformations topic test

Name: _____ Date: _____

15 questions | 41 marks | 45 minutes

A hand-written review of coordinates, rigid movements, transformation order and invariants.

No calculator needed.

1. Translate $P(2, -1)$ 3 units left and 4 units up. [2 marks]

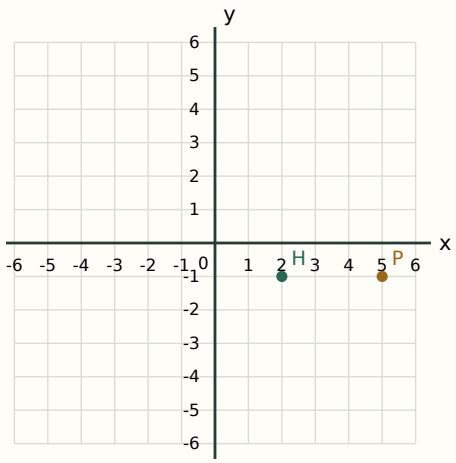
2. Reflect $A(-5, 2)$ in the x-axis. [1 mark]

3. Reflect $B(0, -4)$ in the y-axis. [1 mark]

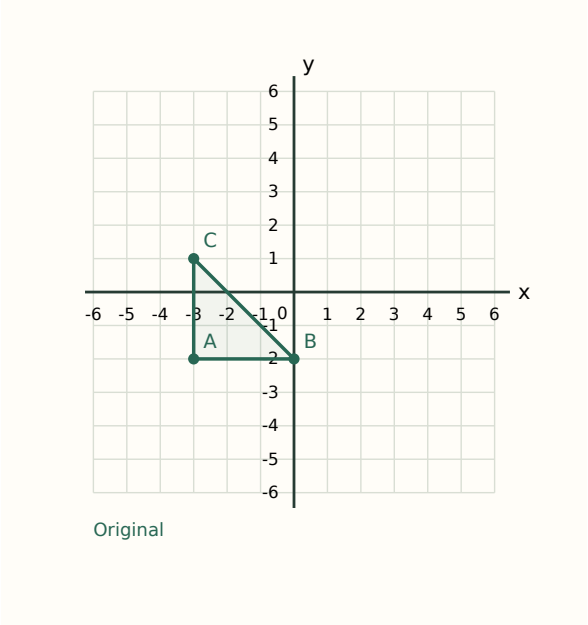
4. The mapping sends $A(-2, -1)$ to $(1, 3)$ and $B(0, 1)$ to $(3, 5)$. Describe the translation and check both points. [2 marks]

5. Rotate $C(-2, 3)$ 90° clockwise about the origin. [2 marks]

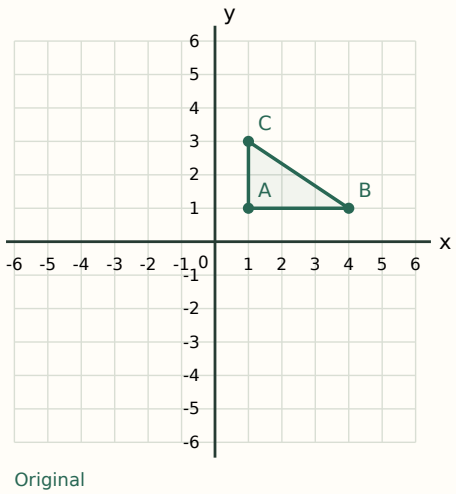
6. Rotate $P(5, -1)$ 180° about $H(2, -1)$. [2 marks]



7. Translate triangle ABC 2 units right and 1 unit up. Give all three image coordinates. Draw and label the image on the supplied grid. [3 marks]



8. Triangle ABC has $A(1, 1)$, $B(4, 1)$ and $C(1, 3)$. Reflect it in the y-axis. [4 marks]



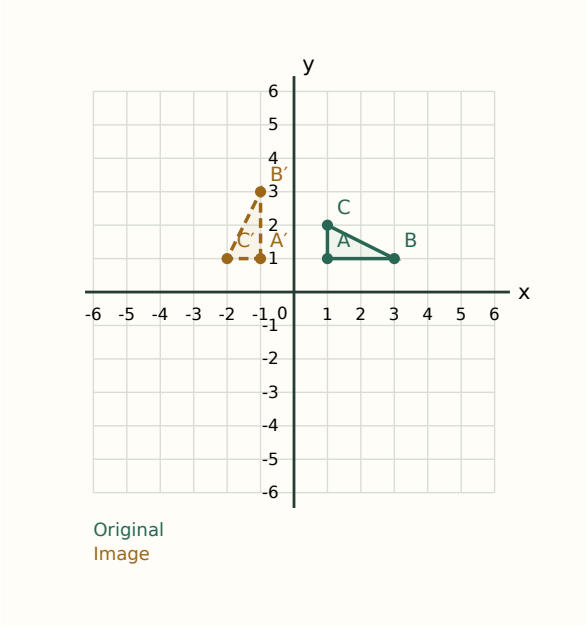
Original

(a) Give the image coordinates of all three vertices. Draw and label the image on the supplied grid. [3 marks]

(b) State whether the clockwise/anticlockwise vertex order is preserved or reversed. [1 mark]

9. A reflection maps $X(3, 2)$ to $(3, -2)$ and $Y(-1, 4)$ to $(-1, -4)$. Name the mirror line and explain. [2 marks]

10. A triangle maps $A(1,1)$ to $A'(-1,1)$, $B(3,1)$ to $B'(-1,3)$ and $C(1,2)$ to $C'(-2,1)$. Describe the rotation, including centre and direction. [3 marks]



11. Reflect $P(-1,2)$ in the y-axis, then move the image 4 units right and 3 units down. Show the intermediate point. [3 marks]

12. Start at $P(2, 3)$ and compare the two orders below. [4 marks]

(a) Move 1 right and 2 down, then reflect in the x-axis. [2 marks]

(b) Reflect in the x-axis first, then move 1 right and 2 down. [2 marks]

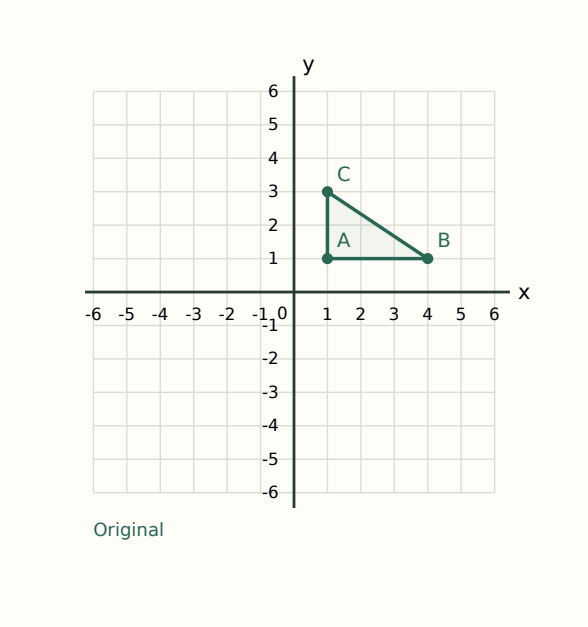
13. A student says a 90° rotation doubles a shape's perimeter. Explain why this is wrong. [2 marks]

14. A robot starts at $(-4, -2)$ on a floor grid. One unit is 1 metre. [4 marks]

(a) It walks 3 m east and 5 m north. Find its new coordinates. [2 marks]

(b) On the map, rotate the robot's new position 180° about the origin. Give the image coordinates. [2 marks]

15. Triangle ABC has $A(1, 1)$, $B(4, 1)$ and $C(1, 3)$. Reflect in the x-axis, then rotate 90° anticlockwise about the origin. [6 marks]



Original

(a) Find the three final vertex coordinates. Draw and label the final image on the supplied grid. [3 marks]

(b) Find the image area and explain whether it is congruent to the original. [3 marks]