Rotations about a point

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Rotate $(2, 4)$ 90° clockwise about the origin. [2 marks]

A 90° clockwise turn uses $(x, y) \mapsto (y, -x)$.

Answer: $(4, -2)$

2. Rotate $(-3, 1)$ 90° anticlockwise about the origin. [2 marks]

A 90° anticlockwise turn uses $(x, y) \mapsto (-y, x)$.

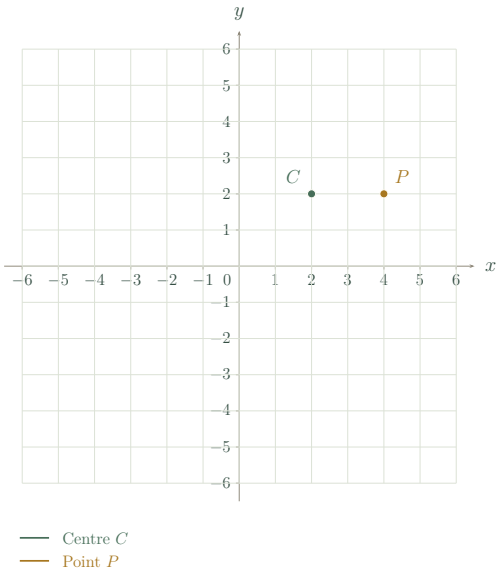
Answer: $(-1, -3)$

3. Rotate $(4, -1)$ 180° about the origin. [2 marks]

Change both signs for a half-turn.

Answer: $(-4, 1)$

4. Rotate $P(4, 2)$ 90° anticlockwise about $C(2, 2)$. [2 marks]

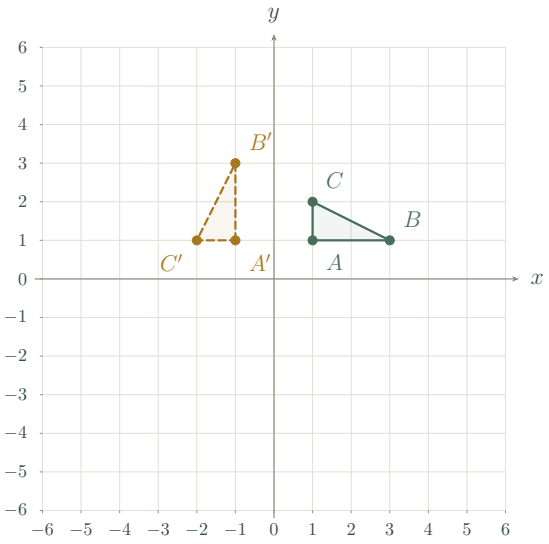


Relative to C, P is 2 units right.

After the turn, it is 2 units above C.

Answer: $(2, 4)$

5. Rotate $A(1,1)$, $B(3,1)$ and $C(1,2)$ 90° anticlockwise about the origin. Draw and label the image on the supplied grid. [3 marks]



Apply $(x, y) \mapsto (-y, x)$ to each vertex.

Answer: $A'(-1,1), B'(-1,3), C'(-2,1)$

6. A point is the centre of a rotation. Where does that point go? Explain. [2 marks]

Its distance from the centre is zero before and after every turn.

Answer: It stays at the same coordinates.