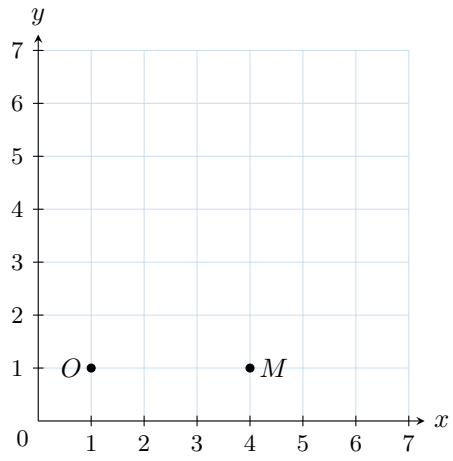
ROTATION

A DEFINITIONS

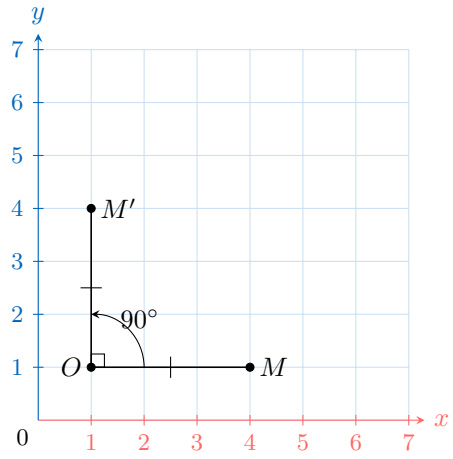
A.1 FINDING THE IMAGE OF A POINT UNDER A 90° ROTATION

Ex 1: Find the coordinates of the image of point M under a rotation of 90° counterclockwise about center O.



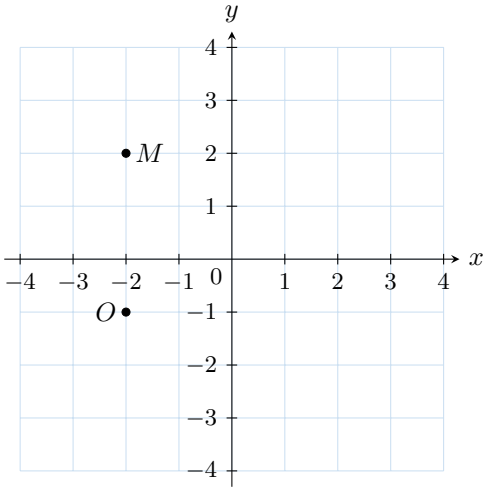
$M'(\boxed{1},\boxed{4})$

Answer:



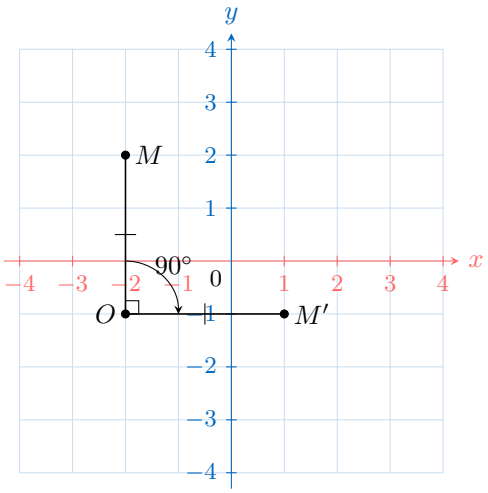
$M'(1, 4)$

Ex 2: Find the coordinates of the image of point M under a rotation of 90° clockwise about center O.



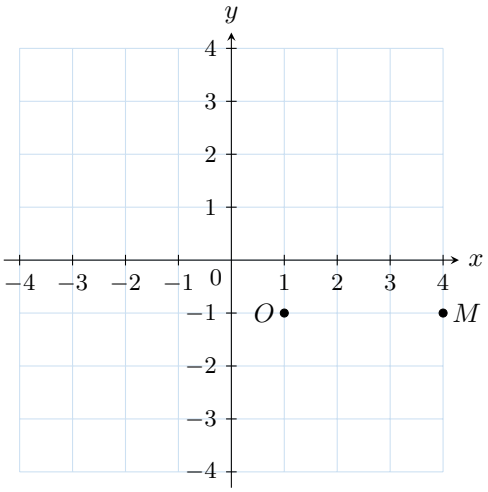
$M'(\boxed{1},\boxed{-1})$

Answer:



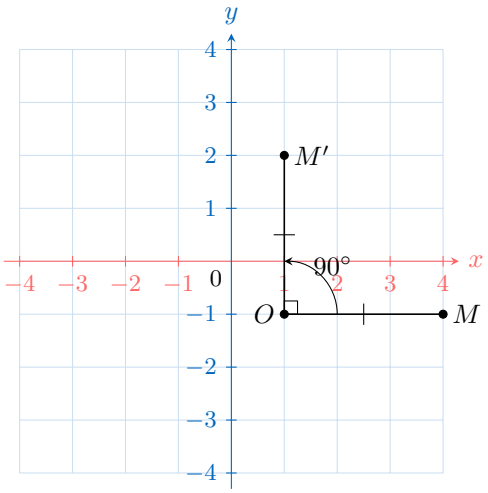
$M'(1, -1)$

Ex 3: Find the coordinates of the image of point M under a rotation of 90° counterclockwise about center O.



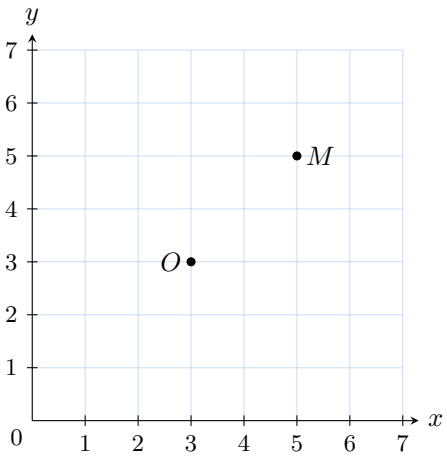
$M'(\boxed{1},\boxed{2})$

Answer:



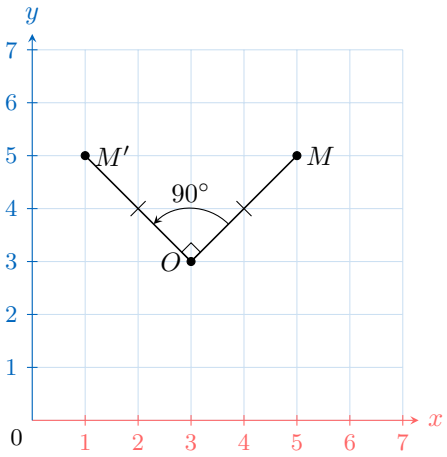
$M'(1, 2)$

Ex 4: Find the coordinates of the image of point M under a rotation of 90° counterclockwise about center O.



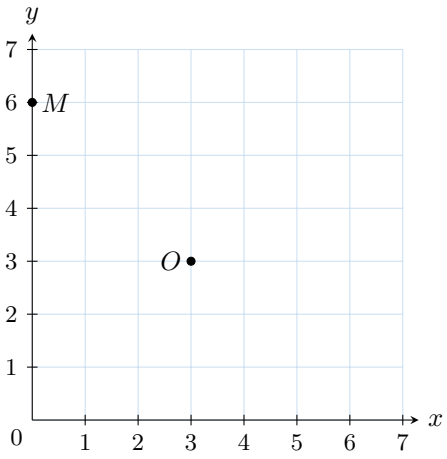
$M'(\boxed{1},\boxed{5})$

Answer:



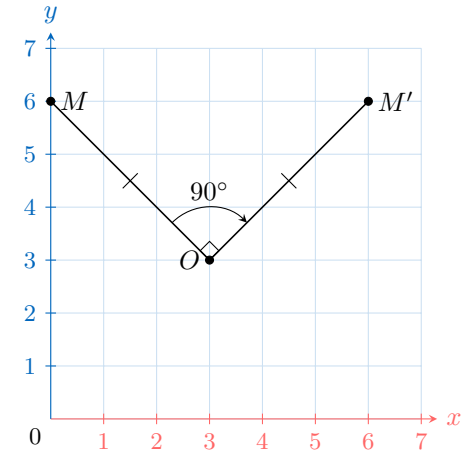
$M'(1,5)$

Ex 5: Find the coordinates of the image of point M under a rotation of 90° clockwise about center O.



$M'(\boxed{6},\boxed{6})$

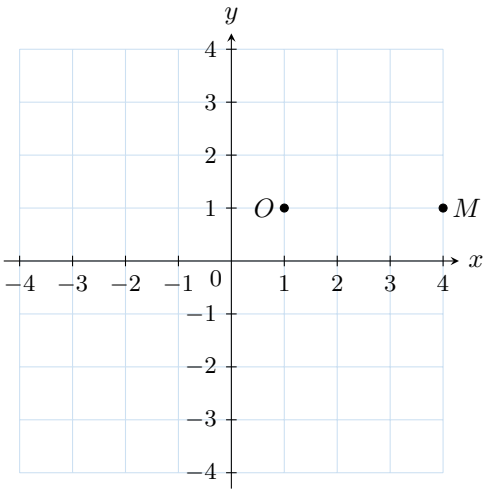
Answer:



$M'(6,6)$

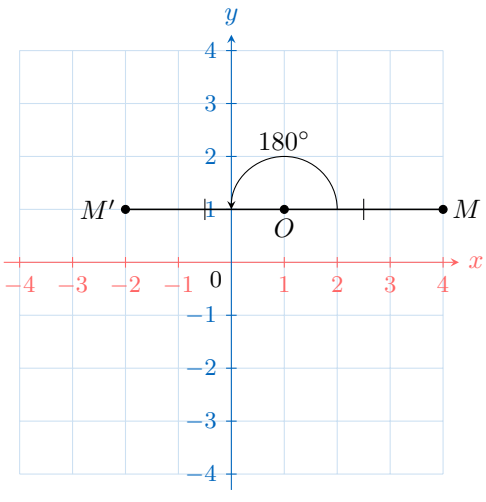
A.2 FINDING THE IMAGE OF A POINT UNDER A 180° ROTATION

Ex 6: Find the coordinates of the image of point M under a rotation of 180° about center O.



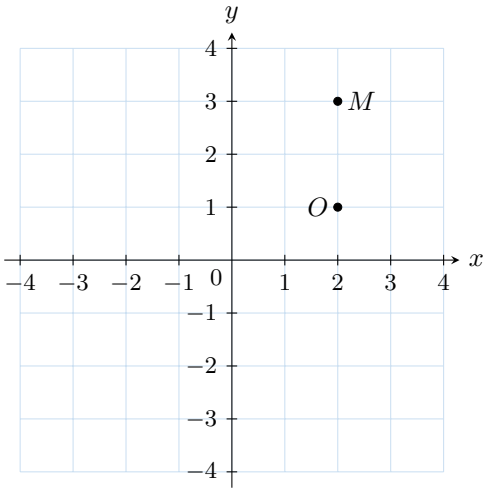
$M'(\boxed{-2},\boxed{1})$

Answer:



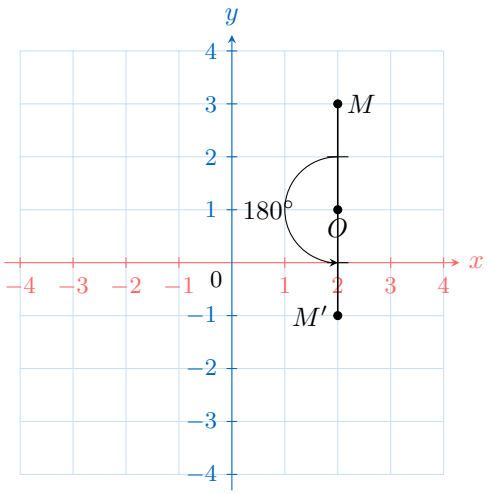
$M'(-2,1)$

Ex 7: Find the coordinates of the image of point M under a rotation of 180° about center O.



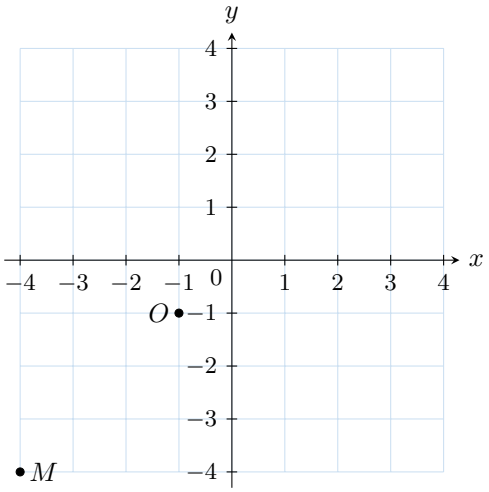
$M'(\boxed{2}, \boxed{-1})$

Answer:



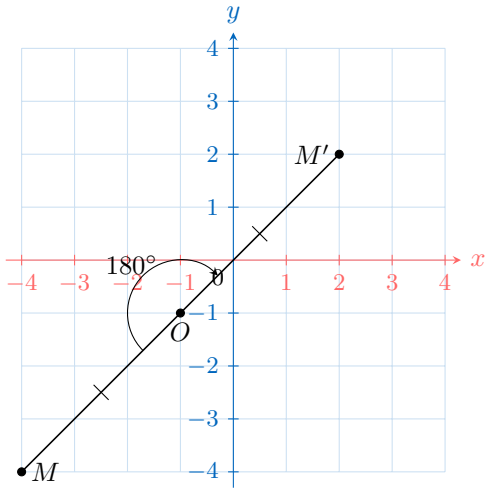
$M'(2, -1)$

Ex 8: Find the coordinates of the image of point M under a rotation of 180° about center O.



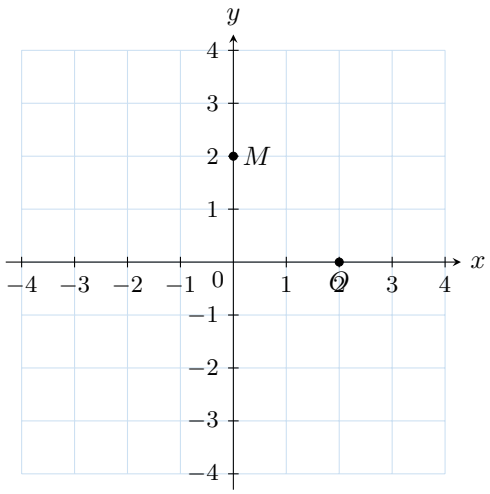
$M'(\boxed{2}, \boxed{2})$

Answer:



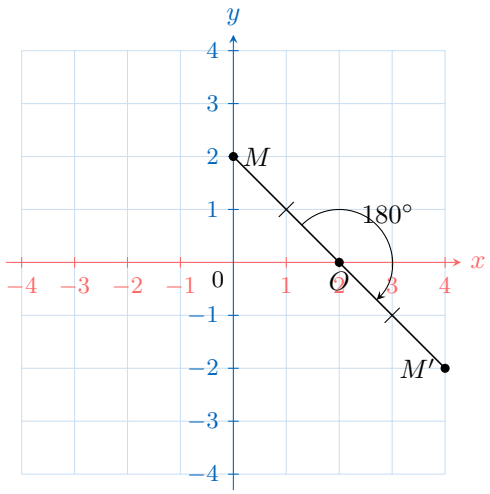
$M'(2, 2)$

Ex 9: Find the coordinates of the image of point M under a rotation of 180° about center O.



$M'(\boxed{4}, \boxed{-2})$

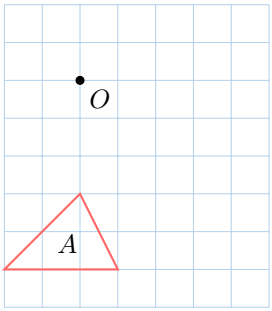
Answer:



$M'(4, -2)$

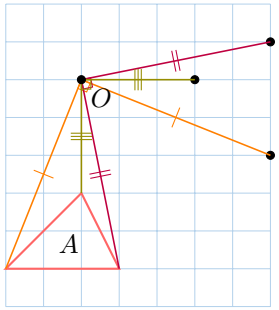
A.3 DRAWING IMAGES FIGURES

Ex 10: Draw the figure A', the image of figure A under a rotation of 90° counterclockwise about center O .

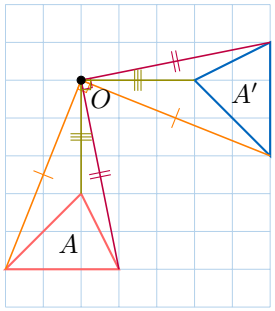


Answer:

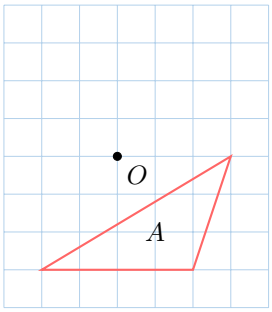
1. **Draw the image vertices**: For each vertex, locate its position relative to center O and rotate it 90° counterclockwise. Place the new points on the grid.



2. **Draw the image figure**: Connect the image vertices with lines in the same order as the original figure.

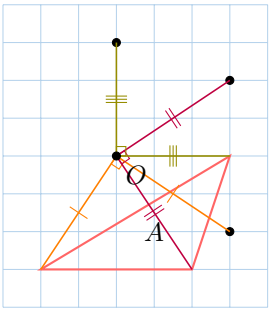


Ex 11: Draw the figure A', the image of figure A under a rotation of 90° counterclockwise about center O .

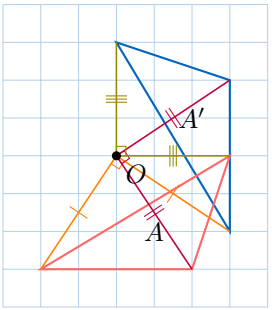


Answer:

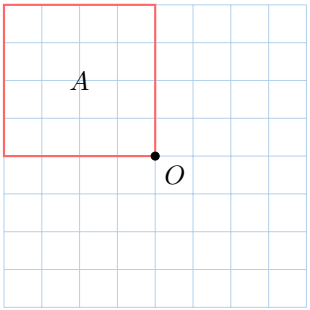
1. **Draw the image vertices**: For each vertex, locate its position relative to center O and rotate it 90° counterclockwise by swapping the relative coordinates and negating the new x-coordinate (i.e., for a point at (x, y) relative to $O(x_O, y_O)$, move to $(-y, x)$ relative to O). Place the new points on the grid.



2. **Draw the image figure**: Connect the image vertices with lines in the same order as the original figure.

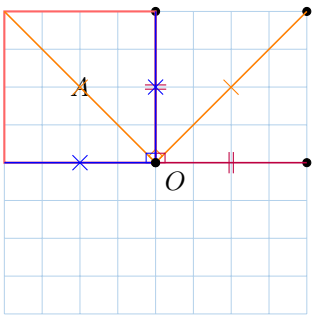


Ex 12: Draw the figure A', the image of figure A under a rotation of 90° clockwise about center O .

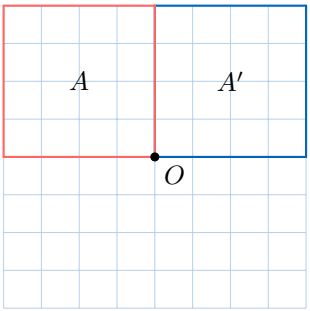


Answer:

1. **Draw the image vertices**: For each vertex, locate its position relative to center O and rotate it 90° clockwise by swapping the relative coordinates and negating the new y-coordinate (i.e., for a point at (x, y) relative to $O(x_O, y_O)$, move to $(y, -x)$ relative to O). Place the new points on the grid.



2. **Draw the image figure**: Connect the image vertices with lines in the same order as the original figure.


A
A′
O