

YOU & MATHS The point $(4, -2)$ is reflected in the x -axis. The resulting point is then reflected in the line with equation $y = x$. What are coordinates of the final point?

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Let us first study what happens after the first reflection. The reflection of point $(4, -2)$ in the x -axis is the point with the same x -coordinate and opposite y -coordinate, that is $(4, 2)$.

The reflection of this latter point in the line with equation $y = x$ can be found by recalling that, if the axis of symmetry is the line that bisects the first and third quadrant (as in this case), the equations of the symmetry are:

$$\begin{cases} x' = y \\ y' = x \end{cases}$$

So point $(4, 2)$ reflected in line $y = x$ becomes point $(2, 4)$ as can be seen from the figure below.

