YOU & MATHS **A fixed line** Verify that the line $x + 5y = 0$ is a fixed line for the point reflection in $(0, 0)$.

Let us choose a point P on the given line, and let (x_P, y_P) be its coordinates. Since P belongs to the line we know that:

$$x_P + 5y_P = 0.$$

Point P is mapped by the reflection onto point P', whose coordinates (x', y') are given by:

$$\begin{cases} x' = -x_P \\ y' = -y_P \end{cases}.$$

Let us check that point $P'(x', y')$ satisfies the equation of the line:

$$x' + 5y' = -x_P - 5y_P = -(x_P + 5y_P) = 0.$$

Therefore point P' belongs to the given line as well, and therefore the line is fixed under the point reflection in $O(0, 0)$.