> **YOU & MATHS** **Only the centre is fixed** Prove that the only fixed point of a non trivial dilation (a dilation that is not the identity) is the centre of dilation.

Let us call O the centre of the dilation, and let k be its factor; $k \neq 1$ since the dilation is not trivial.

We know that O is a fixed point for the dilation.

Let us consider a point P of the plane, different from O; the dilation maps P onto P', and we know that:

$$\vec{OP} = k \cdot \vec{OP'}.$$

Therefore $\vec{OP} \neq \vec{OP'}$, since $k \neq 1$.

This implies that P and P' cannot coincide, since if they did coincide, then we would have $\vec{OP} = \vec{OP'}$.

Therefore P is not a fixed point for the dilation.