Q.1 Let transformation $T : \mathbb{R}^3 \to \mathbb{R}^4$ be given by

$$T \begin{pmatrix} x \\ y \\ z \end{pmatrix} := T \begin{pmatrix} x \\ 0 \\ y \\ 0 \end{pmatrix}.$$

Find $\ker(T)$ and $\dim(\ker(T))$. Without calculating $\mathrm{rang}(T)$, precise the $\dim(\mathrm{rang}(T))$.

"Start where you are. Use what you have. Do what you can." ∼ Arthur Ashe