STEP/Vectors Q9 (30/6/23)

Are the vectors $\begin{pmatrix}1\\0\\0\end{pmatrix}$ & $\begin{pmatrix}0\\0\\0\end{pmatrix}$ linearly independent?

Solution

Is there a non-trivial solution to $\alpha\begin{pmatrix}1\\0\\0\end{pmatrix}+\beta\begin{pmatrix}0\\0\\0\end{pmatrix}=\begin{pmatrix}0\\0\\0\end{pmatrix}$?

Yes: eg $\alpha=0,\beta=1$

So $\begin{pmatrix}1\\0\\0\end{pmatrix}$ & $\begin{pmatrix}0\\0\\0\end{pmatrix}$ are not linearly independent.