

**Problem 1:** Define “Basis”. Give an example of a basis for  $\mathbb{R}^3$ .

**Problem 2:** Define “Dimension”. What is the dimension of the span of

$$\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 2 \\ 2 \end{pmatrix}?$$

**Problem 3:** Define “Nullity”. What is the nullity of

$$A = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}?$$