Problem Set 3
Due on Fri, Jul 18

1) Let $\vec{v}_1, \dots, \vec{v}_m$ be vectors in a subspace V of $\mathbb{R}^n$. Show that if they form a basis of V, then any $\vec{v} \in V$ can be expressed uniquely as a linear combination $\vec{v} = c_1\vec{v}_1 + \cdots + c_m\vec{v}_m$, where $c_1, \dots, c_m$ are constants.

2) Find a basis of the image of A and a basis of the kernel of A.

$$\text{(a)} \quad A = \begin{bmatrix} 2 & 4 & 8 \\ 4 & 5 & 1 \\ 7 & 9 & 3 \end{bmatrix}, \qquad \text{(b)} \quad A = \begin{bmatrix} 4 & 8 & 1 & 1 & 6 \\ 3 & 6 & 1 & 2 & 5 \\ 2 & 4 & 1 & 9 & 10 \\ 1 & 2 & 3 & 2 & 0 \end{bmatrix}.$$