Supplementary homework problems for week 6.

1. Let $A = \begin{bmatrix} 1 & 2 & 3 & 5 \\ 2 & -1 & 1 & 0 \\ 1 & -1 & 0 & -1 \end{bmatrix}$

   (a) Find a basis X for the column space (image) of A.

   (b) What is the dimension of the column space of A?

   (c) Find a basis Y for the null space of A.

   (d) What is the dimension of the null space (kernel) of A?

   (e) Find a basis Z for the row space of A.

   (f) What is the dimension of the row space of A?

2. Let $V = \{\mathbf{a}, \mathbf{b}\}$ be a collection of vectors in $\mathbb{R}^n$. Show that $\text{Span}(V)$ is a subspace of $\mathbb{R}^n$.