1. Write $\begin{bmatrix} 5 \\ 5 \end{bmatrix}$ in coordinates from basis $B = \{ \begin{bmatrix} 2 \\ 1 \end{bmatrix}, \begin{bmatrix} -1 \\ 2 \end{bmatrix} \}$

2. What is the dimension of the vector space $F(\{1, 2, 3, 4, 5\}, \mathbb{R})$ consisting of all functions from the set $\{1, 2, 3, 4, 5\}$ to $\mathbb{R}$?

3. What are the dimensions of the kernel and range of the linear map $T : \mathbb{R}^3 \to \mathbb{R}^3$ such that $T( \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} ) = \begin{bmatrix} x_1 \\ x_2 \\ 0 \end{bmatrix}$?

4. Suppose $V$ is a $p$-dimensional vector space.
   (a) Is any linearly independent set of $p$ vectors in $V$ automatically a basis for $V$?
   (b) Is any set of $p$ vectors in $V$ that span $V$ automatically a basis?