1. Determine if the following sets of vectors are linearly independent or linearly dependent.

   (a) $\vec{\mathbf{v_1}} = \begin{bmatrix} 2 \\ 0 \\ 3 \end{bmatrix}$ $\vec{\mathbf{v_2}} = \begin{bmatrix} 0 \\ -1 \\ 6 \end{bmatrix}$ $\vec{\mathbf{v_3}} = \begin{bmatrix} -2 \\ -4 \\ 21 \end{bmatrix}$

   (b) The columns of $A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & -3 & 4 \\ -1 & 3 & 2 \end{bmatrix}$

2. If A is 4×5, are the columns linearly independent or linearly dependent? What if A is 5×4?

3. If the system $A\vec{\mathbf{x}} = \vec{\mathbf{b}}$ has a unique solution, are the columns of A linearly independent or linearly dependent? Why?