QUIZ 4

1. (3 points) True or False
   - (1) **T/F**   The null space of $m \times n$ matrix is a subspace of $\mathbb{R}^m$.
   - (2) **T/F**   The column space of $m \times n$ matrix is a subspace of $\mathbb{R}^m$.
   - (3) **T/F**   The row space of $m \times n$ matrix is a subspace of $\mathbb{R}^m$.

2. Given a set of vectors

$$\mathbf{a}_1 = \begin{bmatrix} 1 \\ 2 \\ 4 \end{bmatrix}, \mathbf{a}_2 = \begin{bmatrix} 2 \\ -1 \\ 5 \end{bmatrix}, \mathbf{a}_3 = \begin{bmatrix} 2 \\ 4 \\ 3 \end{bmatrix}, u = \begin{bmatrix} 2 \\ -1 \\ 10 \end{bmatrix}$$

   - (1) (3 points) Show that the above set of vectors $\mathcal{B} = \{\mathbf{a}_1, \mathbf{a}_2, \mathbf{a}_3\}$ form a basis for $\mathbb{R}^3$.
   - (2) (3 points) Find the coordinates of the vector u below in this coordinate-system (i.e. find $[u]_{\mathcal{B}}$).