This quiz is worth 10 points. Name: _____

1. (2 points) Very briefly, explain how you can conclude *without any computation* that the vectors below are linearly **dependent**.

$$v_1 = \begin{bmatrix}1\\2\\3\\4\end{bmatrix}, v_2 = \begin{bmatrix}2\\1\\4\\3\end{bmatrix}, v_3 = \begin{bmatrix}1\\-1\\1\\0\end{bmatrix}, v_4 = \begin{bmatrix}1\\0\\1\\0\end{bmatrix}, v_5 = \begin{bmatrix}\pi\\\sqrt{2}\\0\\1\end{bmatrix}$$

2. (5 points) Show the vectors $a_1 = \begin{bmatrix}1\\0\\0\\1\end{bmatrix}, a_2 = \begin{bmatrix}1\\1\\1\\0\end{bmatrix}, a_3 = \begin{bmatrix}0\\-1\\1\\1\end{bmatrix}$ are linearly **independent.**

3. (3 points) Show that the vectors $x_1 = \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}, x_2 = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}, x_3 = \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix}$ are linearly **dependent**.

   (Note: You don't need to look too hard.)

4. (1 point bonus) Answer Question 3 above in a different way.