Math 205 Quiz 2
Name: KEY

1. Consider the following augmented matrix (in ref) for a system of equations written $[A|\vec{b}]$.

$$\left[\begin{array}{ccc|c} 2 & 0 & 3 & 1 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 0 & 0 \end{array}\right]$$

   (a) Write the solution to the system in Parametric Vector Form.

   (b) Write the solution to homogeneous equation ($A\vec{x} = \vec{0}$) in Parametric Vector Form. (This shouldn't take any additional work.)

   (c) Although you do not know the columns of the matrix A, do the columns of A form a linearly independent set? If so, explain. If not, find a linear dependence relation.

2. Let $\vec{v} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$. Consider the Span$\{\vec{v}, \vec{h}\}$ where $\vec{h} \in \mathbb{R}^2$.

   What must be true of $\vec{h}$ for the Span$\{\vec{v}, \vec{h}\} = \mathbb{R}^2$.

3. If the equation $A\vec{x} = \vec{0}$ has exactly one solution, then does $A\vec{x} = \vec{b}$ have exactly one solution for every $\vec{b}$? Explain.