Linear Algebra Quiz 7 Name: _____

This quiz has six problems worth 10 points.

1. (4 points) Give examples of matrices for which the number of solutions to $A\mathbf{x} = \mathbf{b}$ is

   (a) 0 or 1, depending on $\mathbf{b}$. Explain your reasoning.

   (b) 0 or ∞, depending on $\mathbf{b}$. Explain your reasoning.

2. (4 points) Find a basis for each subspace below.

   (a) The subspace of 2×2 matrices consisting of all upper triangular matrices.

   (b) The subspace of $\mathbb{R}^4$ consisting of all vectors orthogonal to $(1, 1, 0, 0)$ and $(1, 0, 1, 0)$.

3. (2 points) [Fill in the blank.] Suppose A is an $m \times n$.

   (a) The vector $\mathbf{d}$ is in the row space of A when _____ has a solution.

   (b) The row space of A is a subspace of $\mathbb{R}^{\square}$.