Quiz 3 (12 am)

1. Find the solutions of the matrix equation $A\mathbf{x} = 0$ where A is the matrix below. For full credit you **must** write your answer in parametric **vector** form. (10 pts.)

$$A = \begin{bmatrix} 1 & 0 & -3 & 2 & 0 \\ -1 & 0 & 3 & -2 & 1 \\ 0 & 0 & 1 & 3 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

2. True or false. Assume the matrix A has 3 rows and 4 columns, so it's size is 3×4, meaning the corresponding system has 3 equations and 4 unknowns. (2 pts. each)

(a) TRUE/FALSE If A has three pivot positions, then the equation $A\mathbf{x} = \mathbf{0}$ has the trivial solution.

(b) TRUE/FALSE If A has three pivot positions, then the equation $A\mathbf{x} = \mathbf{0}$ has a non-trivial solution.

(c) TRUE/FALSE If $\mathbf{x}$ is a nontrivial solution to $A\mathbf{x} = \mathbf{0}$, then every entry in $\mathbf{x}$ is nonzero.

(d) TRUE/FALSE If A has three pivot positions, then the equation $A\mathbf{x} = \mathbf{b}$ is always consistent for all $\mathbf{b} \in \mathbb{R}^3$.

(e) TRUE/FALSE The homogeneous system $A\mathbf{x} = 0$ has infinitely many solutions.