Quiz # 1

Name:

January 31st, 2008

True / False

1. It is possible for a system of equations with more variables than equations to have exactly 2 solutions.
2. If the reduced row-echelon form of an augmented matrix corresponding to a system has a row like $[0 \dots 0|1]$, then the system has no solutions.
3. A system with fewer equations than variables can still have a unique solution.
4. The collection of all vectors of the form $(0, a, 2a)$ is a subspace of $\mathbb{R}^3$.
5. If $\mathbf{v}$ is non-zero, then $\mathbf{v} \cdot \mathbf{v} > 0$.
6. The set $\{(0, 1, 0), (0, 0, 1), (0, -1, 2)\}$ is linearly independent.

Number of Solutions

For each of the following matrices in row-echelon form, indicate if there are 0 solutions, 1 solution, infinitely many solutions, or not enough information to decide.

7. $\left[\begin{array}{cccc|c} 1 & 0 & 1 & 2 & 6 \\ 0 & 0 & 1 & 3 & 7 \\ 0 & 0 & 0 & 1 & 8 \end{array}\right]$
8. $\left[\begin{array}{ccc|c} 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 3 \\ 0 & 0 & 0 & 1 \end{array}\right]$
9. $\left[\begin{array}{ccc|c} 1 & 2 & 3 & 4 \\ 0 & 1 & 6 & 206 \\ 0 & 0 & 1 & -47 \end{array}\right]$
10. $\left[\begin{array}{cc|c} 1 & 0 & 3 \\ 0 & 1 & 4 \\ 0 & 0 & 0 \end{array}\right]$