

Quiz # 1

Name: Solutions

January 31st, 2008

True / False

- F** 1. It is possible for a system of equations with more variables than equations to have exactly 2 solutions.
- T** 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.
- F** 3. A system with fewer equations than variables can still have a unique solution.
- T** 4. The collection of all vectors of the form $(0, a, 2a)$ is a subspace of \mathbb{R}^3 .
- T** 5. If \mathbf{v} is non-zero, then $\mathbf{v} \cdot \mathbf{v} > 0$.
- F** 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. $\begin{bmatrix} 1 & 0 & 1 & 2 & | & 6 \\ 0 & 0 & 1 & 3 & | & 7 \\ 0 & 0 & 0 & 1 & | & 8 \end{bmatrix}$ *only many*

8. $\begin{bmatrix} 0 & 1 & 0 & | & 2 \\ 0 & 0 & 1 & | & 3 \\ 0 & 0 & 0 & | & 1 \end{bmatrix}$ *0 solutions*

9. $\begin{bmatrix} 1 & 2 & 3 & | & 4 \\ 0 & 1 & 6 & | & 206 \\ 0 & 0 & 1 & | & -47 \end{bmatrix}$ *1 solution*

10. $\begin{bmatrix} 1 & 0 & | & 3 \\ 0 & 1 & | & 4 \\ 0 & 0 & | & 0 \end{bmatrix}$ *1 solution*