Exam #1, Linear Algebra, Spring, 2003, W. Stephen Wilson

Name: \underline{Answer Sheet}

TA Name and section: __________________________ (1 point for recognizability and 1 point for spelling)

\textbf{NO CALCULATORS. KEEP IT OFF YOUR DESK.} All questions are true-false questions. The scoring is as follows: Wrong answer, 0 points; No answer, 1 point; Correct answer, 2 points; Correct answer with correct reason, 3 points. If you can’t answer something in less than a minute, move on. Use very very short, trivial, nearly frivolous (but true) reasons. Say anything true.

1. A system of 4 equations in 3 unknowns is always inconsistent.
   
   \begin{tabular}{ll}
   T & F \\
   \hline
   \end{tabular}

2. If \(A\) is any invertible \(n \times n\) matrix then \(\text{rref}(A) = I_n\).
   
   \begin{tabular}{ll}
   T & F \\
   \hline
   \end{tabular} \quad \text{both rank } = n

3. The image of a \(3 \times 4\) matrix is a subspace of \(\mathbb{R}^4\).
   
   \begin{tabular}{ll}
   T & F \\
   \hline
   \end{tabular} \quad \text{in } \mathbb{R}^3

4. There is a \(3 \times 4\) matrix of rank 4.
   
   \begin{tabular}{ll}
   T & F \\
   \hline
   \end{tabular} \quad \text{Max } 3

5. The formula \((A^2)^{-1} = (A^{-1})^2\) holds for all invertible matrices \(A\).
   
   \begin{tabular}{ll}
   T & F \\
   \hline
   \end{tabular} \quad (A,B)^{-1} = B^{-1}A^{-1}

6. The span of the vectors \(\vec{v}_1, \vec{v}_2, \ldots, \vec{v}_n\) consists of all linear combinations of \(\vec{v}_1, \vec{v}_2, \ldots, \vec{v}_n\).
   
   \begin{tabular}{ll}
   T & F \\
   \hline
   \end{tabular} \quad \text{Definition}

7. There exists a system of 3 linear equations in 3 unknowns with exactly 3 solutions.
   
   \begin{tabular}{ll}
   T & F \\
   \hline
   \end{tabular} \quad \text{None } \cup \text{ one } \cup \text{ } \infty