Math 544  
Linear Algebra  
Spring 2001, USC

QUIZ 5  
Time: 10min

1. If $u$ and $v$ are in $\mathbb{R}^n$, how are $u^T v$ and $v^T u$ related? How are $uv^T$ and $vu^T$ related?

2. Does the matrix $\begin{bmatrix} 7 & 9 \\ -6 & -8 \end{bmatrix}$ have an inverse? Why or why not? If there exists an inverse, what is it?

*Each part is worth 5 points.*

**Bonus (5 points)** Let $T: \mathbb{R}^n \to \mathbb{R}^m$ be a linear transformation. Prove that $T$ is one-to-one if and only if the equation $T(x) = 0$ has only the trivial solution.