Math 104 **Fall 2009**

Homework 3

Due Wednesday, October 14, 2009

1. Fill in the missing words: if $AB = 0$ then the columns of B are in the _____ of A, and the rows of A are in the _____ of B.

2. Find the matrix Q corresponding to the orthogonal projection onto the linear space spanned by $\begin{bmatrix}1\\1\\1\end{bmatrix}$ and $\begin{bmatrix}1\\0\\1\end{bmatrix}$.

3. Exercise 2.3, Chapter 2 of Trefethen-Bau (a Hermitian matrix is a matrix obeying $A^* = A$). [Hint: when writing $Ax = \lambda x$, think about taking the dot product on both sides with a judiciously chosen vector, e.g. x for part a)?]

4. Exercise 2.6, Chapter 2 of Trefethen-Bau.