

MATH 333 – Section 002 – Quiz 9

You may work with other class members on this quiz, but you may *not* receive assistance from people not in MATH 333 (Section 002). You must show all of your work to receive full credit. Do all your work on other sheets of paper and be sure to staple all the pieces of paper together or **YOU WILL GET A 'ZERO' ON THE QUIZ**. Do not use decimal approximations unless asked to do so. All final solution functions should real-valued. Your work on this quiz must be handed in by Friday, 13 April 2007 at 1340. **GOOD LUCK!**

1) Let λ be an eigenvalue of the $n \times n$ matrix A with associated eigenvector \mathbf{x} . Let μ be a scalar. Prove that $\lambda - \mu$ is an eigenvalue of the matrix $A - \mu I$, where I is the $n \times n$ identity matrix.

2) Find all eigenvalues and associated eigenvectors of the matrix

$$\begin{bmatrix} -1 & 0 & -2 \\ 0 & 0 & 0 \\ -1 & 0 & 0 \end{bmatrix}$$

3) Find all eigenvalues and associated eigenvectors of the matrix

$$\begin{bmatrix} 1 & 0 & 0 \\ 1 & 3 & 2 \\ 0 & 0 & 1 \end{bmatrix}$$

4) Find all eigenvalues and associated eigenvectors of the matrix

$$\begin{bmatrix} 1 & -2 & 1 \\ 0 & 3 & 0 \\ 0 & 1 & 1 \end{bmatrix}$$