Math 214 Spring 2007

BONUS QUIZ 6

Linear Systems

Name: ____________________________

Date: ______________________

Friday March 30
Ron Buckmire

Topic : Properties of Eigenvalues

The idea behind this quiz is to provide you with an opportunity to illustrate your understanding of properties of eigenvalues and determinants.

Reality Check:

EXPECTED SCORE : __________ **/10** ACTUAL SCORE : __________ **/10**

Instructions:

0. Please look for a hint on this quiz posted to `faculty.oxy.edu/ron/math/214/07/`
1. Once you open the quiz, you have **30 minutes** to complete, please record your start time and end time at the top of this sheet.
2. You may use the book or any of your class notes. You must work alone.
3. If you use your own paper, please staple it to the quiz before coming to class. If you don't have a stapler, buy one. **UNSTAPLED QUIZZES WILL NOT BE GRADED.**
4. After completing the quiz, sign the pledge below stating on your honor that you have adhered to these rules.
5. Your solutions must have enough details such that an impartial observer can read your work and determine HOW you came up with your solution.
6. Relax and enjoy...
7. **This quiz is due on Monday April 2**, in class. NO LATE QUIZZES WILL BE ACCEPTED.

Pledge: I, ______________________, pledge my honor as a human being and Occidental student, that I have followed all the rules above to the letter and in spirit.

1. **TRUE or FALSE** – put your answer in the box. That answer is worth 1 point. To receive ANY credit, you must also give a brief, and correct, explanation in support of your answer! Remember a statement is TRUE only if it is ALWAYS true, and it is FALSE if there exists an example which makes it FALSE.

(a) (*3 points*) For any $n \times n$ matrix A there exists a real number λ and a $n \times 1$ vector $\vec{x}$ such that $A\vec{x} = \lambda\vec{x}$.

(b) (*3 points*) A is singular (not invertible) if and only if A has at least one zero eigenvalue. In other words, IF A is singular, THEN A has at least one zero eigenvalue *AND* IF A has at least one zero eigenvalue, THEN A is singular.

(c) (*4 points*) The eigenvectors of A^T are the same as the eigenvectors of A.