

Quiz 7

Linear Systems

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Time Begun: \_\_\_\_\_

Time Ended: \_\_\_\_\_

Friday March 24

Ron Buckmire

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**Topic :** Eigenvalues and Eigenvectors of 2x2 Matrices

The idea behind this quiz is for you to indicate your understanding of the eigenvalues and eigenvectors associated with a matrix.

**Reality Check:**

EXPECTED SCORE : \_\_\_\_\_/10

ACTUAL SCORE : \_\_\_\_\_/10

**Instructions:**

1. Please look for a hint on this quiz posted to [faculty.oxy.edu/ron/math/214/06/](http://faculty.oxy.edu/ron/math/214/06/)
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. QUIZZES WITH UNSTAPLED SHEETS 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 March 27**, in class. NO LATE OR UNSTAPLED 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.

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1. Consider the matrix  $A = \begin{bmatrix} 0 & 2 \\ 2 & 3 \end{bmatrix}$  and its inverse,  $A^{-1} = \begin{bmatrix} -3/4 & 1/2 \\ 1/2 & 0 \end{bmatrix}$ .

a. (2 points). Find the eigenvalues,  $\lambda_1$  and  $\lambda_2$ , of  $A$

b. (4 points). Find the corresponding eigenvectors  $\vec{x}_1$  and  $\vec{x}_2$  of  $A$

c. (2 points). Find the eigenvalues,  $\hat{\lambda}_1$  and  $\hat{\lambda}_2$ , of  $A^{-1}$ .

d. (2 points). Show that the eigenvectors of  $A^{-1}$  are the same eigenvectors,  $\vec{x}_1$  and  $\vec{x}_2$ , as  $A$