

## BONUS QUIZ 3

*Linear Systems*

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

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

**Friday February 22**  
Ron Buckmire

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**Topic :** Matrix Inverse, Transpose and Linear Dependence

The idea behind this quiz is for you to illustrate your understanding of the transpose, inverse and identity matrix, as well as linear dependence.

### 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/214/08/](http://faculty.oxy.edu/ron/math/214/08/)
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. **NO UNSTAPLED QUIZZES WILL BE ACCEPTED.**
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 February 25**, 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.

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1. TRUE or FALSE – put your answer in the box (1 point). To receive FULL credit, you must also give a brief, and correct, explanation in support of your answer! Remember if you think a statement is TRUE you must prove it is ALWAYS true. If you think a statement is FALSE then all you have to do is show there exists a counterexample which proves the statement is FALSE at least once.

(a) **TRUE or FALSE?** “If a set of vectors in  $\mathbb{R}^n$  is **linearly dependent**, then the set must contain more vectors than there are components in each vector.”

(b) **TRUE or FALSE?** “The matrix products  $AA^T$  and  $A^T A$  are defined for every matrix  $A$ .”

(c) **TRUE or FALSE?** “There exists no idempotent matrix which is invertible.”