BONUS QUIZ 6 — Linear Systems

Name: ______________________________

Date: ____________________ **Friday April 6**

Ron Buckmire

Topic : Diagonalization!

The idea behind this quiz is to provide you with an opportunity to illustrate your understanding of diagonalizability.

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 9**, 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. *10 points.* **Poole, page 362, #9.** Let $A = \begin{bmatrix} -5 & -6 & 3 \\ 3 & 4 & -3 \\ 0 & 0 & -2 \end{bmatrix}$

a. *3 points.* Show that the characteristic polynomial is $p(\lambda) = 4 - 3\lambda^2 - \lambda^3 = (\lambda + 2)^2(1 - \lambda)$.

b. *1 point.* Find all the eigenvalues of A and their algebraic multiplicities.

c. *3 points.* Find bases for each of the eigenspaces of A and their geometric multiplicities.

d. *3 points.* Determine whether A is diagonalizable. If A is not diagonalizable, explain why not. If A is diagonalizable, find an invertible matrix P and a diagonal matrix D such that $P^{-1}AP = D$ and $A = PDP^{-1}$.