Math 214 Spring 2007

BONUS QUIZ 3

Linear Systems

Name: _____

Date: _____

Friday February 16
Ron Buckmire

Topic : Span and Linear Independence

The idea behind this quiz is for you to indicate your understanding of the material from Chapter 2 of the text, specifically your linear independence of vectors.

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.
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 Wednesday February 20**, 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.In the following two cases, determine whether $\text{span}\,(\vec{u},\vec{v},\vec{w}) = \mathbb{R}^3$ or not.
(a) *4 points.* Suppose $\vec{u} = \begin{bmatrix} 1 & 1 & 0 \end{bmatrix}$, $\vec{v} = \begin{bmatrix} 1 & 0 & 1 \end{bmatrix}$ and $\vec{w} = \begin{bmatrix} 0 & 1 & 1 \end{bmatrix}$.
Does $\text{span}\,(\vec{u},\vec{v},\vec{w}) = \mathbb{R}^3$? **EXPLAIN YOUR ANSWER!**

(b) *4 points.* Suppose $\vec{u} = \begin{bmatrix} 1 & -1 & 0 \end{bmatrix}$, $\vec{v} = \begin{bmatrix} -1 & 0 & 1 \end{bmatrix}$ and $\vec{w} = \begin{bmatrix} 0 & -1 & 1 \end{bmatrix}$.
Does $\text{span}\,(\vec{u},\vec{v},\vec{w}) = \mathbb{R}^3$? **EXPLAIN YOUR ANSWER!**

(c) *2 points.* Are the vectors in part **(a)** linearly independent or linearly dependent? Are the vectors in part **(b)** linearly independent or linearly dependent? **EXPLAIN YOUR ANSWER!**