Math 370 Fall 2002

Quiz **8**

Name: _____

Date: _____

Time Begun: _____

Time Ended: _____

Friday November 1

Ron Buckmire

Topic : More Fun with Norms

The idea behind this quiz is for you to get more insight into relative differences between norms.

Instructions:

1. Once you open the quiz, you have as much time as you need to complete it, but record your start time and end time at the top of this sheet.

2. You may use the textbook or any of your class notes. You must work alone. However, you are strongly encouraged to ask questions on the Class Web Messageboard.

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 Monday November 4**, 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. Prove the following statements for a random vector $\vec{x}$

(a) *[4 pts]* Show that $||\vec{x}||_1 \leq n||\vec{x}||_\infty$

(b) *[4 pts]* Show that $||\vec{x}||_2 \leq \sqrt{n}||\vec{x}||_\infty$

(c) *[2 pts]* Thus which is bigger $||\vec{x}||_2$ or $||\vec{x}||_1$?