Math 212 Fall 2005

Quiz **11** **Multivariable Calculus**

Name: _____

Date: _____ **Wednesday November 30**
Time Begun: _____ Ron Buckmire
Time Ended: _____

Topic : Line Integrals

The idea behind this quiz is to provide you with another opportunity to illustrate your ability to compute line integrals.

Reality Check:

EXPECTED SCORE : _____**/10** ACTUAL SCORE : _____**/10**

Instructions:

0. Before you open the quiz, check the course website or Blackboard for a hint.
1. Once you open the quiz, **you have 30 minutes to complete it**.
2. You may not use your text or any other source, including course materials. You may use a calculator. You must work alone. Do not discuss the contents of this quiz with anyone.
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 or borrow one. UNSTAPLED PAPERS 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. **This quiz is due on Monday, December 5**, at the beginning of 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.

Math 212 Fall 2005 **SHOW ALL YOUR WORK** Quiz **Eleven**

1. Consider the vector field $\vec{F}(x, y) = (1 - ye^{-x}, e^{-x})$.

(a) *(5 points.)* Show that the line integral of $\vec{F}$ along the straight line path from $(0, 1)$ to $(1, 2)$ is $2e^{-1}$. [HINT: $\int u\, e^u\, du = ue^u - e^u$]

(b) *(3 points.)* Show that this vector field is a **gradient field**, in other words there exists a function $f(x, y)$ such that $\vec{\nabla} f = \vec{F} = (1 - ye^{-x}, e^{-x})$.

(c) *(2 points.)* Use the Fundamental Theorem for Line Integrals to show that the value of the line integral of $\vec{F}$ from $(0, 1)$ to $(1, 2)$ is the same regardless of the path taken.