Math 212 Spring 2006

BONUS Quiz **10**   **Multivariable Calculus**

Name: _____

Date: _____   **Friday April 21**
Time Begun: _____   Ron Buckmire
Time Ended: _____

Topic : More Multiple Integration

The idea behind this quiz is to provide you with another opportunity to illustrate your facility with multiple integration.

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/212/06/`.

1. Once you open the quiz, you have as much time as you like to complete it, 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. **Quizzes with loose sheets 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 24**, in class. NO LATE QUIZZES WILL BE AC-CEPTED.

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. (*5 points.*) Evaluate $\displaystyle\int\int\int_S \frac{dx\ dy\ dz}{(x^2 + y^2 + z^2)^{3/2}}$ where S is the solid bounded by the spheres $x^2 + y^2 + z^2 = a^2$ and $x^2 + y^2 + z^2 = b^2$ and $a > b > 0$.

2. (*5 points.*) Write down a multiple integral which can be used to compute the volume $V = \frac{1}{6}a^2 h$ of a pyramid with height h and a right isosceles triangular base where the equal sides are of length a (where $h >> a > 0$). The location of the apex of the pyramid is above the right angle. (**HINT: think of this as the volume under a plane which intersects the x and y axis at a and the z-axis at h.**)