

Due April 2, 2004

Collaborators

Name

Directions: Be sure to follow the guidelines for writing up projects as specified in the course information sheet (passed out on the first day of class). Whenever appropriate, use in-line citations, including page numbers and people consulted when you present information obtained from discussion, a text, notes, or technology. **Only write on one side of each page.**

“Examinations are formidable even to the best prepared, for the greatest fool may ask more than the wisest man can answer.” – Charles Caleb Colton, 1825

Project Description

For this project please submit your efforts on exactly one (1) of the following. (However, you should be able to do every problem in the list.)

1. Use a calculator or spreadsheet to compute three estimates $M_{8,8}$, $U_{8,8}$, $L_{8,8}$ for the following double integral where $R = [0, 1] \times [0, 1]$

$$\iint_R e^{-x^2-y^2} dA$$

Using 64 squares of equal size. Here $M_{8,8}$ refers to selecting the midpoints of each subrectangle, $U_{8,8}$ refers to selecting the point in each subrectangle giving the largest value of $f(x, y)$ over that subrectangle, and $L_{8,8}$ refers to the selecting the point in each subrectangle giving the smallest value of $f(x, y)$ over that subrectangle. Finish by explaining why you know your estimate $M_{8,8}$ is accurate to within $\frac{1}{2}[U_{8,8} - L_{8,8}]$.

2. Set up (an) iterated integral(s) for the volume of the solid that remains when a square hole of side length 2 is drilled through a sphere of radius $\sqrt{2}$.