Mathematics 221   Spring 2004   Project 7,8

Not Collected

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.**

"Thought is only a flash between two long nights, but this flash is everything." – Poincaré, Jules Henri (1854-1912)

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. The plane $x + y + 2z = 2$ intersects the paraboloid $z = x^2 + y^2$ in an ellipse. Find the points on the ellipse that are nearest to and farthest from the origin.

2. Find an approximate value for the integral below where $R = \{(x, y) : 0 \leq x \leq 2,\ 0 \leq y \leq 1\}$, $\Delta x = 1$, and $\Delta y = 0.5$

$$\iint\limits_{R} \left(x - 3y^2 \right)\ dA.$$

   (a) (Use a spreadsheet or calculator). Approximate the same integral over the same rectangle R but this time use $\Delta x = 0.1$ and $\Delta y = 0.05$.