Math 324E **Exam 2** **Autumn 2005**

Your Name | Your Signature

Problem	Total Points	Score
1	10	
2	10	
3	10	
4	10	
5	10	
Total	50	

- This exam is closed book. You may use one hand-written 3”x5” card for notes, though if you don’t have it by now, it’s a little late to do anything about it.
- Only non-graphing scientific calculators are allowed.
- In order to receive credit, you must show your work. You must also justify all conclusions you make. Do not assume something is obvious. If you feel something is clear enough to not necessitate algebra, write a sentence or two explaining your reasoning. Do not do computations in your head. Instead, write them out on the exam paper.
- Place a box around YOUR FINAL ANSWER to each question.
- If you are unable to simplify an anwer, leave it in a form that can be put in to a calculator. Do not assumer that every answer will be simple.
- If you need more room, use the backs of the pages and indicate to the reader that you have done so.
- Raise your hand if you have a question.

1 (10 points) Evaluate

$$\int_C xe^y \, ds,$$

along the curve $\vec{r}(t) = \langle \cos t, \sin t, t \rangle$ from $t = 0$ to $t = \frac{\pi}{2}$.

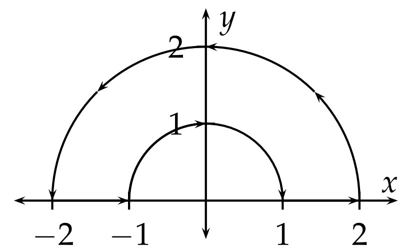
2 (10 points) Evaluate

$$\int_{-2}^{2}\int_{0}^{\sqrt{4-x^2}}\int_{\sqrt{x^2+y^2}}^{4} x^2 - y \, dz \, dy \, dx$$

3 (10 points)

Evaluate the integral

$$\int_C \vec{F} \cdot d\vec{r}$$



where $\vec{F}(x, y) = \langle x^2 y, x^3 + e^y \rangle$, over the curve C, defined by going in a straight line from $(1, 0)$ to $(2, 0)$, from here to $(-2, 0)$ counterclockwise along the top of the circle $x^2 + y^2 = 4$, then in a straight line to $(-1, 0)$, then clockwise along the top of the circle $x^2 + y^2 = 1$ back to $(1, 0)$. See the picture.

4 (10 points) Find the volume between the planes $z = y$, $z = 2 - y$, and the function $z = x^2$. Be careful setting up the integral.

5 (10 points) Evaluat the integral

$$\int_C \vec{F} \cdot d\vec{r}$$

where $\vec{F}(x,y,z) = \left\langle y\cos(xy) + \frac{1}{z}, x\cos(xy) + 2yz, -\frac{x}{z^2} + y^2 \right\rangle$ and $\vec{r}(t) = \langle t^2, \cos^2(\pi t), 2t \rangle$, and t goes from 0 to $\frac{1}{2}$.