Math 142, Exam 2, Spring 2011

Write everything on the blank paper provided. **You should KEEP this piece of paper.** If possible: return the problems in order (use as much paper as necessary), use only one side of each piece of paper, and leave 1 square inch in the upper left hand corner for the staple. If you forget some of these requests, don't worry about it – I will still grade your exam.

The exam is worth 50 points. SHOW your work. $\boxed{CIRCLE}$ your answer. **CHECK** your answer whenever possible.

No Calculators or Cell phones. I will post the solutions on my website shortly after the exam is finished.

1. (5 points) Define the definite integral. Give a complete definition. Be sure to explain all of your notation. Write in complete sentences.

2. (5 points) Compute $\int_{-1}^{3} \frac{1}{x^4} dx$.

3. (5 points) Find the area between $x + y^2 = 9$ and $2y - x + 1 = 0$.

4. (5 points) Consider a solid whose base is the triangular region with vertices $(0, 0)$, $(1, 0)$, and $(0, 1)$. The cross sections of this solid perpendicular to the y -axis are equilateral triangles. Find the volume of the solid.

5. (6 points) Find $\int \sec x \tan^2 x \, dx$. **Check your answer.**

6. (6 points) Find $\int \frac{x^3 - 3x^2 - x + 5}{x^3(x-1)} \, dx$. **Check your answer.**

7. (6 points) Find $\int \frac{x+4}{x^2+2x+5} \, dx$. **Check your answer.**

8. (6 points) Find $\int \frac{1}{x^2\sqrt{25-x^2}} \, dx$. **Check your answer.**

9. (6 points) Find $\int \frac{dx}{\sqrt{x^2-9}}$. **Check your answer.**