Math 142, Exam 2, Spring 2012

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.

1. (6 points) Define the definite integral. Give a complete definition. Be sure to explain all of your notation. Write in complete sentences.

2. (6 points) Consider the region bounded by $y = 2x$ and $y = x^2$. Revolve this region about the line $y = 5$. Find the volume of the resulting solid. You must draw a meaningful picture. What rectangle are you revolving? What does it become? Why are the dimensions what you say they are?

3. (6 points) Consider the solid whose base is bounded by $\frac{x^2}{9} + \frac{y^2}{16} = 1$ in the xy-plane. Each cross section of the solid perpendicular to the y-axis and perpendicular to the base is a square. Find the volume of the solid. You must draw a meaningful picture.

4. (6 points) Find $\int_0^3 \frac{1}{(x-1)^2} dx$.

5. (6 points) Find $\int \cos^5 x \sin^2 x dx$. You must check your answer.

6. (5 points) Find $\int \frac{e^x}{1+e^{2x}} dx$. You must check your answer.

7. (5 points) Find $\int \frac{1}{x^2+4x+5} dx$. You must check your answer.

8. (5 points) Find $\int \sec^3 x \tan^5 x dx$. You must check your answer.

9. (5 points) Find $\int \frac{x-1}{x^4+4x^2} dx$. You must check your answer.