Math 142, Exam 2, Fall 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. This work must be coherent and correct. $\boxed{\textit{CIRCLE}}$ your answer. **CHECK** your answer whenever possible.

No Calculators or Cell phones.

The solutions will be posted later today.

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) Find $\displaystyle\int \frac{e^{3x}}{\sqrt{e^{3x}+1}}\,dx$. **Check your answer.**

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

4. (6 points) Find $\displaystyle\int \frac{1}{x^2-3x+2}\,dx$. **Check your answer.**

5. (6 points) Find $\displaystyle\int \frac{1}{4x^2+8x+5}\,dx$. **Check your answer.**

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

7. (7 points) Find the volume of the solid that is obtained by revolving the region bounded by $y = x^2$ and $y - x = 2$ about the line $x = 5$. You must draw a meaningful picture.

8. (7 points) Consider a solid S whose base in the xy plane is the region bounded by $y = x^2$ and $y - x = 2$. Each cross-section of S perpendicular to the x-axis is an equilateral triangle. Find the volume of S . You must draw a meaningful picture.