# Math 142, Exam 2, Fall 2009

PRINT Your Name:________________________

When does your FRIDAY class meet? _______
Write your answers as legibly as you can.

There are 10 problems on 5 pages. The exam is worth 100 points. Each problem is worth 10 points. SHOW your work. Make your work be coherent and clear. Write in complete sentences whenever this is possible. $\boxed{CIRCLE}$ your answer. **CHECK** your answer whenever possible. **No Calculators or Cell phones.**

I will post the solutions on my website a few hours after the exam is finished.

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

2. Compute $\displaystyle\int_{-1}^{3} \frac{1}{x^2} dx$ .

3. Find the area between $x + y = 0$ and $2 = x + y^2$.

4. Suppose that a conical tank is filled with oil which has a density of 50 $\text{lb/ft}^3$. The radius at the top of the tank is 5 ft and the tank is 15 ft high. How much work is done in pumping the oil over the edge of the tank? **Be sure to include units in your answer.**

5. Consider the region bounded by $y = x^3$, $x = 1$, and $y = 0$. Revolve this region about the $y$-axis. Find the volume of the resulting solid.

6. Find the limit of the sequence whose $n^{\text{th}}$ term is $a_n = \left(\frac{3+n}{n}\right)^n$.

7. Find $\displaystyle\int \frac{3x-4}{x^2-3x+2}dx$ . **Check your answer.**

8. Find $\displaystyle\int \frac{3x^2+8x+10}{x^3+2x^2+5x}dx$ . **Check your answer.**

9. Find $\int \ln x dx$ . **Check your answer.**

10. Find $\int \frac{dx}{(1-x^2)^{3/2}}$ . **Check your answer.**