MATH 142, EXAM 3, SPRING, 2004

PRINT Your Name:____________________________________

There are 10 problems on 5 pages. Each problem is worth 10 points. SHOW your work. $\boxed{CIRCLE}$ your answer. **NO CALCULATORS! CHECK** your answer whenever possible.

If I know your e-mail address, I will e-mail your grade to you. If I don't already know your e-mail address and you want me to know it, then **send me an e-mail**.

If you would like, I will leave your exam outside my office after I have graded it. (I will send you an e-mail when I am finished with it.) You may pick it up any time between then and the next class. **Let me know if you are interested.**

I will post the solutions on my website at about 4:00 PM today.

1. Find $\int \sin^3 x \cos^2 x \, dx$. Check your answer.

2. Find $\int x \ln x \, dx$. Check your answer.

3. Find $\int \frac{\ln x}{x} \, dx$. Check your answer.

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

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

6. Find $\int \sqrt{1-x^2} \, dx$. Check your answer.

7. Find $\displaystyle\lim_{x \to 0} \frac{\cos x - 1 + \frac{x^2}{2}}{x^4}$.

8. Find $\lim_{x \to 0} \frac{\cos x}{x-2}$.

9. Find the limit of the sequence whose n^{th} term is $a_n = \left(\frac{n-1}{n+1}\right)^n$.

10. Find $\int_{-1}^{3} \frac{1}{x^2} \, dx$.