Math 142, Exam 2, Fall, 2004

PRINT Your Name:______________________________

There are 11 problems on 5 pages. The exam is worth 100 points. SHOW your work. $\boxed{\textit{CIRCLE}}$ 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 door tomorrow morning, 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. (9 points) Solve $3\log_2 x = 7 + \log_2(2x)$. Check your answer.

2. (9 points) Find the area of the region bounded by $y = \frac{\ln x}{x}$, the x-axis, $x = e^2$ and $x = e^3$.

3. (10 points) If $y = 3x^2 \arcsin(2x)$, then find $\frac{dy}{dx}$.

4. (9 points) The population of the United States was 3.9 million in 1790 and 178 million in 1960. If the rate of growth is assumed proportional to the number present, what estimate would you give for the population in 2000? (You may leave ln in your answer.)

5. (9 points) Find the value of $\sin(2\arccos\frac{5}{13})$.

6. (9 points) Find $\int \sin^5 x \cos^2 x\,dx$. Check your answer.

7. (9 points) Find $\int \frac{1}{\sqrt{9-4x^2}}\,dx$. Check your answer.

8. (9 points) Find $\int \frac{x}{\sqrt{9-4x^2}}\,dx$. Check your answer.

9. (9 points) Find $\int \frac{1}{\sqrt{9+4x^2}}\,dx$. Check your answer.

10. (9 points) Find $\int \cos^4 x\,dx$. Check your answer.

11. (9 points) Find $\int \sin 2x \sin 3x\,dx$. Check your answer.