Fall 2001, Exam 2, Math 142

PRINT Your Name:_____

There are 11 problems on 5 pages. Problem 1 is worth 10 points. Each of the other problems is worth 9 points. SHOW your work. $\boxed{CIRCLE}$ your answer. **NO CALCULATORS! CHECK** your answer whenever possible. If you want to pick up your exam before Monday, write a short note to that effect on the top of this page and I will leave your exam outside my office door, before I go home tonight.

1. Find $\int \cos^5 x dx$. Check your answer.

2. Find $\int \cos^4 x dx$.

3. Find $\int \cos 4x \cos 5x dx$.

4. Find $\int \tan^3 x dx$. Check your answer.

5. Find $\int x e^x dx$. Check your answer.

6. Find $\int \frac{1}{\sqrt{x^2+4x+5}} dx$.

7. Find $\int \frac{e^{2x}}{1+e^{2x}} dx$. Check your answer.

8. Find $\int \frac{e^x}{1+e^{2x}} dx$. Check your answer.

9. Solve the differential equation $\frac{dy}{dx} - \frac{y}{x} = 3x^2$. Check your answer.

10. Let $f(x) = x^2 - 2x$ for $x \leq 1$. Find $f^{-1}(x)$.

11. Find the volume of the solid generated by revolving the region bounded by $y = e^x$, the x -axis, the y -axis, and $x = 1$ about the x -axis.