

**Math 142, Fall 2000, Exam 3**

PRINT Your Name: \_\_\_\_\_

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

1. Find  $\int x\sqrt{1-x} dx$  .

2. Find  $\int x\sqrt{1-x^2} dx$  .

3. Find  $\int \sqrt{1-x^2} dx$  .

4. Find  $\int xe^x dx$  .

5. Find  $\int xe^{x^2} dx$  .

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

7. Find  $\lim_{x \rightarrow \infty} \frac{e^{-x}}{x^{-1}}$  .

8. Find  $\int \frac{2x^3 + 5x^2 + x + 3}{x^2(x^2 + 1)} dx$  .

9. Find the third Taylor polynomial  $P_3(x)$  for  $f(x) = \ln(x+1)$  about  $a = 0$  .

10. Take  $P_3(x)$  and  $f(x)$  from problem 9. Find an upper bound for the error that is introduced if  $f(x)$  is approximated by  $P_3(x)$  for  $|x| \leq \frac{1}{100}$  .