Name (Please Print) ______________________ Rec. Instr. ______________________

Your Signature ______________________ Class Time ______________________

ANALYTIC GEOMETRY AND CALCULUS II

Exam 2

October 19, 1999

§9.3 – 9.8, 10.2

Be neat, clear and complete. Show all work. No notes, books, reference material or calculators are allowed. No credit will be given for answers without supporting work. **DO NOT SIMPLIFY.** IF AN INTEGRAL IS IMPROPER, SO STATE AND EVALUATE IT ACCORDINGLY.

1. Integrate:

(9) a) $\displaystyle\int_1^e x \ln x \, dx$

(9) b) $\displaystyle\int x^2 e^x dx$

(9) c) $\displaystyle\int \sin^3 \theta \cos^2 \theta \, d\theta$

(9) d) $\displaystyle\int \frac{3x^3 + 6x^2 + 7x + 6}{(x+1)^2 \cdot (x^2+1)}\, dx$

(9) e) $\displaystyle\int \frac{x^3\, dx}{\sqrt{4 - x^2}}$

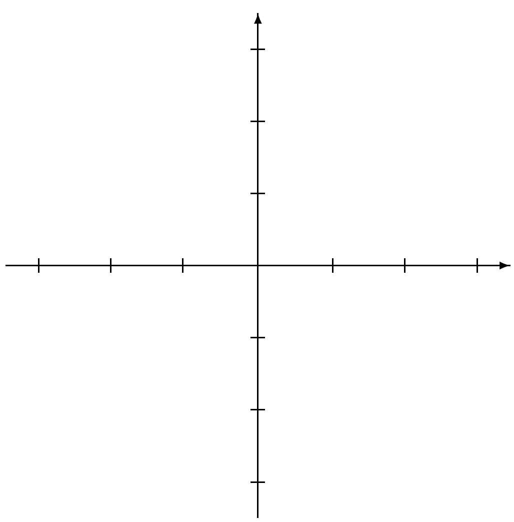
(9) f) $\displaystyle\int \frac{\sqrt{9x^2 - 25}}{x}\, dx$

(9) g) $\displaystyle\int \frac{2x+1}{x^2 - 2x + 17}\, dx$

(9) h) $\displaystyle\int_{-2}^{2} \frac{2x\,dx}{x^2-1}$

(10) 2. Find the area under the curve $y = xe^{-x}$ for $1 \le x < \infty$.

(9) 3. Sketch a graph of the polar curve $r = 2\sin 2\theta$ and fill in the table. Show with arrows how the curve is traced out from $\theta = 0$ to $\theta = \pi$.



θ	$r = 2\sin 2\theta$
0	
$\pi/4$	
$\pi/2$	
$3\pi/4$	
π	
$5\pi/4$	
$3\pi/2$	
$7\pi/4$	
2π	

(9) 4. Find all the points of intersection of the polar graphs $r = 1 - \cos\theta$ and $r = 1 + \sin\theta$.