Name (Please Print) _____ Rec. Instr. _____

Your Signature _____ Class Time _____

ANALYTIC GEOMETRY AND CALCULUS II
Exam 2
October 21, 1997

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.

1. Integrate. If an integral is improper, so indicate and determine whether or not it converges and if so, what its value is.

(10) (a) $\displaystyle\int \csc^2\theta \cot^3\theta \, d\theta$

(10) (b) $\displaystyle\int \frac{\ln x}{x^3}\, dx$

(10) (c) $\displaystyle\int \frac{-2x^2+3x+1}{(x+1)(x^2+1)}\, dx$

(10) (d) $\displaystyle\int \frac{dx}{x^2+8x+20}$

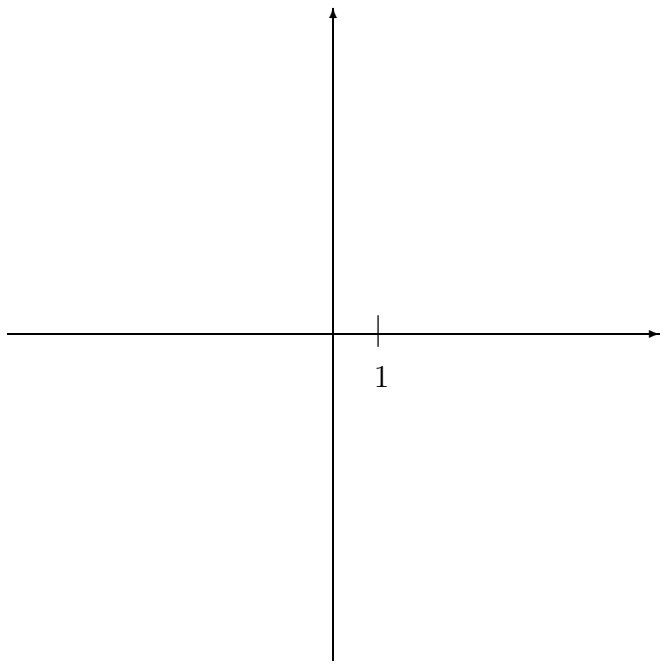
(10) (e) $\displaystyle\int \frac{dx}{x^2\sqrt{4x^2-25}}$

(10) (f) $\displaystyle\int_{-\infty}^{0} \frac{1}{\sqrt{4-x}}\,dx$

(10) (g) $\displaystyle\int_{0}^{\infty} xe^{-2x}dx$

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

2. Plot the graph of $r = 3 + 2\sin\theta$. First fill in the chart.



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

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

Extra Credit

(10) Integrate: $\displaystyle\int \csc^3\theta \, d\theta$