MATH 221: Calculus and Analytic Geometry
Prof. Ram, Spring 2000

Lecture 4: MIDTERM EXAM 1
September 25, 2000

This is a 50 minute exam. No books, notes or calculators are allowed. There are 14 problems on this exam. All problems are worth 10 points each. Doing the easier ones first will probably help to maximize your total points.

Name: ____

TA and Section: ____________________________________

Problem	Score
1.	
2.	
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Total	

Problem 1. Let g be a function. Show that $\dfrac{dg^4}{dx} = 4g^3 \dfrac{dg}{dx}$.

Problem 2. Find $\dfrac{dy}{dx}$ when $y = e^{x^2+2x}$.

Problem 3. What is $\csc^{-1} x$?

Problem 4. Compute $\sin\frac{\pi}{6} + \cos\frac{\pi}{6}$ in radical form.

Problem 5. Explain why $\dfrac{dx^n}{dx} = nx^{n-1}$, for $n = 0$.

Problem 6. Verify the identity $\cos B \cos(A+B) + \sin B \sin(A+B) = \cos A$.

Problem 7. Find $\dfrac{dy}{dx}$ when $y = \dfrac{\sin 2x}{\cos x}$.

Problem 8. Find $\dfrac{dy}{dx}$ when $y = e^{3\ln x}$.

Problem 9. Verify the identity $\sin(x/2) = \pm\sqrt{\dfrac{1-\cos x}{2}}$.

Problem 10. Compute $\sin\frac{\pi}{3} + \cos\frac{\pi}{6} - \tan\frac{\pi}{4}$ in radical form.

Problem 11. Find $\dfrac{dy}{dx}$ when $y = \dfrac{\tan x - \cot x}{\tan x + \cot x}$.

Problem 12. Verify the identity $\ln x^n = n \ln x$.

Problem 13. Find a complex number z such that $z+w = w$ for all other complex numbers w.

Problem 14. Verify the identity $e^{x+y} = e^x e^y$.