MATH 221: Calculus and Analytic Geometry
Prof. Ram, Fall 2006

Lectures 4 and 5: MIDTERM EXAM 3, Sample
November 27, 2006

This is a 50 minute exam. No books, notes or calculators are allowed. There are 10 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.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
Total	

Problem 1. Compute $\displaystyle\int \frac{x+1}{x^2+2x-3}\,dx$.

Problem 2. Compute $\displaystyle\int \frac{(1+2x)^3}{x^4}\,dx$.

Problem 3. Compute $\displaystyle\int_{\pi/6}^{\pi/3} \csc^2\theta \; d\theta$.

Problem 4. Let $f(x)$ be a function which is continuous and let $A(x)$ be the area under $f(x)$ from a to x. Compute the derivative of $A(x)$ by using limits.

Problem 5. Graph the curve $y = (1/2)x^2 + 1$ and the straight line $y = x + 1$ and find the area between the curve and the line.

Problem 6. Compute $\displaystyle\int \frac{1}{\sqrt{3-4x}}\,dx$.

Problem 7. Compute $\displaystyle\int \frac{\sec^2 x}{\sqrt{1-\tan^2 x}}\, dx$.

Problem 8. Find the volume generated when the area bounded by $y = \sqrt{x}$, $y = 2$ and $x = 0$ is rotated about the line $y = 2$.

Problem 9. Find the center of mass of a solid right circular cone if the density varies as the distance from the base.

Problem 10. Use integration to show that the surface area of a sphere of radius r is $4\pi r^2$.