Print Name: _____ **Student Number:** _____

Section Time: _____

Math 20C.
Midterm Exam 2
November 21, 2005

Read each question carefully, and answer each question completely.
Show all of your work. No credit will be given for unsupported answers.
Write your solutions clearly and legibly. No credit will be given for illegible solutions.

1. (6 points)

   (a) Find the tangent plane approximation $L(x, y)$ of the function

   $$f(x, y) = \sin(2x + 3y) + 1$$

   at the point $(-3, 2)$.

   (b) Use the approximation above to estimate the value of $f(-2.8, 2.3)$.

#	Score
1	
2	
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4	
Σ	

2. (6 points) Find the absolute maximum and absolute minimum of

$$f(x, y) = 2 + xy - 2x - \frac{1}{4}y^2$$

in the closed triangular region with vertices given by $(0, 0)$, $(1, 0)$, and $(0, 2)$. Justify your answer.

3. (6 points) Using Lagrange multipliers find the maximum and minimum values of

$$f(x, y) = 2(x + 1)y,$$

subject to the constraint

$$x^2 + y^2 = 1.$$

Show all your work.

4. (6 points) Compute the double integral of the function

$$f(x, y) = \frac{x}{y} e^{3x^2},$$

in the domain

$$R = \{(x, y) \in I\!R^2 : \quad 0 \leq x \leq 1, \quad 1 \leq y \leq 3\}.$$

Show all your work.