

Name: _____ Section: _____

TA: _____ Time: _____

Math 21C.
Midterm Exam 2
May 21, 2003

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. Consider the function $f(x, y) = e^{-x} \cos y$.

(a) Find all the second partial derivatives of f .

(b) Determine whether or not f is a solution to Laplace's Equation, $u_{xx} + u_{yy} = 0$.

#	Score
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2. Consider the function $f(x, y) = x^2 + \sin xy$.

(a) Find the gradient of f at the point $(1, 0)$.

(b) Find the directions in which the directional derivative of f at $(1, 0)$ has the value 1.

3. Find the extreme values of $f(x, y) = 2x^2 + 5y^2$ on the disk $x^2 + y^2 \leq 1$.

4. Evaluate

$$\iint_R y e^{yx} dA,$$

where $R = [0, 2] \times [0, 2]$.