V1

1	2	3	4	5	6

Last Name:_____

First Name:_____

ID:_____ Section:____

Math 250 Midterm #2. October 10, 2003

Attention! Please, note that this is the closed book test. You are not allowed to use graphing calculator. Simple calculators are allowed. Please, show all important steps in you solution but do not make your solution excessively long.

1. If

$$f(x, y) = \cos(x^2 + y^3),$$

find

$$\frac{\partial^2 f}{\partial x \, \partial y}.$$

2. Prove that the following limit does not exist

$$\lim_{(x,y)\to(0,0)} \frac{xy}{x+y^2}.$$

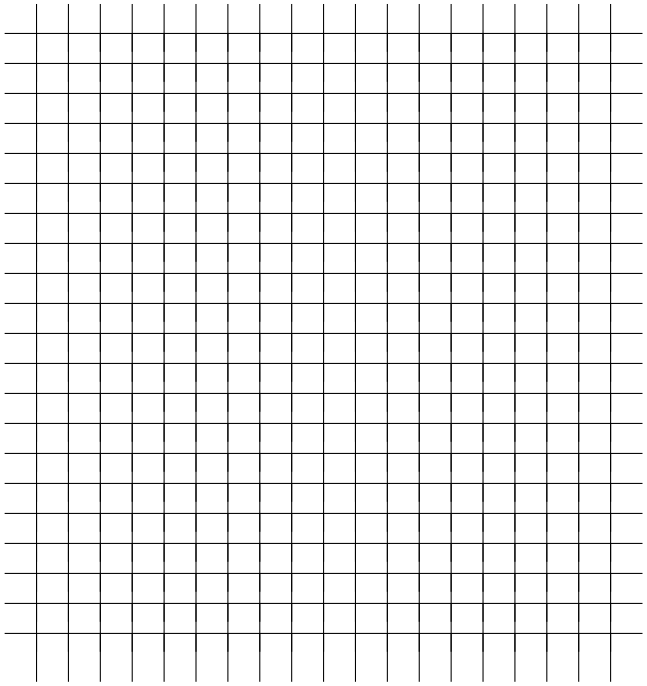
3. Find the gradient of the function

$$f(x, y, z) = \cos(xz) - \sqrt{y}$$

at the point $(1, 2, 3)$.

4. Sketch the graph of the cylindrical equation

$$z = r \sin \theta$$



5. Find $\dfrac{\partial z}{\partial x}$ if

$$z \cos x + z^2 y = 0.$$

6. Find the equation of the tangent plane to the graph of

$$z = \sqrt{x^2 + y^2}, \qquad \text{at the point } p = (3, 4).$$