

Name _____ ID _____

MATH 251

Quiz 3

Spring 2006

Sections 506

P. Yasskin

1-3	/15
4	/10
Total	/25

Multiple Choice: (5 points each)

1. For the function $f(x, y) = x^2e^{xy}$ which partial derivative is incorrect?

a. $\frac{\partial f}{\partial x} = 2xe^{xy} + x^2ye^{xy}$

b. $\frac{\partial f}{\partial y} = x^3e^{xy}$

c. $\frac{\partial^2 f}{\partial x^2} = 2e^{xy} + 4xye^{xy} + x^2y^2e^{xy}$

d. $\frac{\partial^2 f}{\partial x \partial y} = 3x^2e^{xy} + x^2y^2e^{xy}$

e. $\frac{\partial^2 f}{\partial y \partial x} = 3x^2e^{xy} + x^3ye^{xy}$

2. Find the equation of the plane tangent to $z = x^3y^2$ at the point $(2, 1, 8)$.

a. $z = 12x + 16y + 8$

b. $z = 12x + 16y - 32$

c. $z = -12x - 16y + 8$

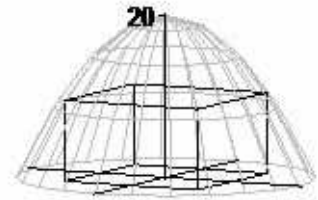
d. $z = -12x - 16y + 48$

e. $z = -12x - 16y + 32$

3. Consider a function $g(x,y)$. If $g(3,2) = 5$, $\frac{\partial g}{\partial x}(3,2) = 4$, and $\frac{\partial g}{\partial y}(3,2) = 2$, estimate $g(3.2, 1.9)$.
- a. 4.0
 - b. 4.2
 - c. 4.4
 - d. 5.6
 - e. 6.0

4. (10 points) Find the dimensions and volume of the largest rectangular box whose base is in the xy -plane, whose sides are parallel to the coordinate planes and whose top 4 vertices are on the elliptic paraboloid

$$z = 20 - x^2 - 5y^2.$$



SOLVE ON THE BACK OF THE SCANTRON.