MATH2850 - Elementary Multivariable Calculus, Spring 2014

Quiz 5 — Solution

Feb 11, 2014

Printed NAME

- You have 15 min to complete your quiz
- Please show all your work neatly and indicate your final answers clearly If you simply write down the final answer without appropriate intermediate steps, you may not get full credit for that problem
- The quiz is closed book and notes **Calculators are not allowed**

GOOD LUCK :)

1. Compute the mixed partial derivatives of

$$u = y \sin^2(x^2 y)$$

$$\frac{\partial u}{\partial x} = 2y \sin(x^2 y) \cos(x^2 y)\, 2xy$$
$$= 2xy^2 \sin(2x^2 y)$$

$$\frac{\partial^2 u}{\partial y \partial x} = 2x\left[2y \sin(2x^2 y) + y^2 \cos(2x^2 y)(2x^2)\right]$$
$$= 4xy\left[\sin(2x^2 y) + yx^2 \cos(2x^2 y)\right]$$

$u, \frac{\partial u}{\partial x}, \frac{\partial u}{\partial y}$ are continuous $\frac{\partial^2 u}{\partial x \partial y} = \frac{\partial^2 u}{\partial y \partial x}$

2. Compute the **slope of the tangent line** to the surface

$$g(x, y) = x^2 + y^3$$

at the point $(-1, 1)$ and lying in the plane $y = 1$

$$\frac{\partial f}{\partial x}\Big|_{(-1,1)} = 2x\Big|_{(-1,1)} = -2$$