

Quiz 13

March 9, 2016

Show all work. Do not simplify your answers.

1. Find $\frac{\partial z}{\partial x}$ if $z = (x^3 + 1)e^{3x^2y}$.

$$\frac{\partial z}{\partial x} = 3x^2 (e^{3x^2y}) + (x^3 + 1) e^{3x^2y} \cdot 6xy$$

2. If $f(x, y) = \frac{xy \ln(x)}{x + y}$, then $f_x = \frac{y(x + y + y \ln(x))}{(x + y)^2}$ and $f_y = \frac{x^2 \ln(x)}{(x + y)^2}$.

Find f_{xy} .

$$f_{xy} = (f_x)_y = \frac{(x+y)^2 [(x+y+y \ln(x)) + y(1+\ln x)] - y(x+y+y \ln(x)) [2(x+y)(1)]}{(x+y)^4}$$

$$f_{xy} = (f_y)_x = \frac{(x+y)^2 [2x \ln x + x^2 \cdot \frac{1}{x}] - x^2 \ln(x) [2(x+y)(1)]}{(x+y)^4}$$