Problem 1

Let $f(x, y) = \sin(xy) + e^y$. Find $\dfrac{\partial f}{\partial x}$ and $\dfrac{\partial f}{\partial y}$.

Problem 2

Let $f(x, y) = \sec(xye^y) + e^{\cos(x^2+y^2)}$. Find $\dfrac{\partial f}{\partial x}$ and $\dfrac{\partial f}{\partial y}$.

Problem 3

Let $f(x, y) = \sqrt{xy^2 + e^{xy}}$. Find $\dfrac{\partial f}{\partial x}$ and $\dfrac{\partial f}{\partial y}$.

Problem 4

For the function from problem 1, verify that $\dfrac{\partial^2 f}{\partial x \partial y} = \dfrac{\partial^2 f}{\partial y \partial x}$.

Problem 5

Find $\dfrac{\partial^2}{\partial x \partial y}\left(ye^{xy} + \tan(y^2\cos(y))\right)$.

Problem 6

Let $f(x, y) = x^2 \sin(xy) + e^{xy}$. Find $\dfrac{\partial^2 f}{\partial x^2}$ and $\dfrac{\partial^2 f}{\partial y^2}$.