Verifique que $\frac{\partial^2 f}{\partial y \partial x} = \frac{\partial^2 f}{\partial x \partial y}$ para $f(x,y) = x^3 e^{-2y} + y^{-2}\cos x$

$$\frac{\partial f}{\partial x}$$

$$f(x,y) = x^3 e^{-2y} + y^{-2} \cos x$$

$$\frac{\partial^2 f}{\partial x} = 3x^2 e^{-2y} - y^{-2} \sin x$$

$$\frac{\partial}{\partial y}\left(\frac{\partial f}{\partial x}\right) = \frac{\partial^2 f}{\partial y \partial x}$$

$$\frac{\partial}{\partial x}\left(3x^2 e^{-2y} - y^{-2} \sin x\right) = -6x^2 e^{-2y} + 2y^{-3} \sin x$$

$$\frac{\partial f}{\partial y}$$

$$\frac{\partial f}{\partial y} = -2x^3 e^{-2y} + 2y^{-3} \cos x$$

$$\frac{\partial}{\partial x}\left(\frac{\partial f}{\partial y}\right) = \frac{\partial^2 f}{\partial x \partial y}$$

$$\frac{\partial}{\partial x}\left(-2x^3 e^{-2y} + 2y^{-3} \cos x\right) = -6x^2 e^{-2y} - 2y^{-3} \sin x$$

$$\frac{\partial^2 f}{\partial y \partial x} \wedge \frac{\partial^2 f}{\partial x \partial y}$$

$$\frac{\partial^2 f}{\partial y \partial x} = -6x^2 e^{-2y} + 2y^{-3} \sin x$$

$$\frac{\partial^2 f}{\partial x \partial y} = -6x^2 e^{-2y} + 2y^{-3} \sin x$$

$$\boxed{\frac{\partial^2 f}{\partial y \partial x} = \frac{\partial^2 f}{\partial x \partial y}}$$