WRITE YOUR NAME:

MAC 2313 Quiz 9
Thursday February 15th

Find the partial derivatives $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$.

$$f(x,y) = x^{17}y^{83} + \sin^2 x + \cos^2 y + e^{xy}$$

To find $\frac{\partial f}{\partial x}$, think of y as constant.

$$f = \underbrace{y^{83}}_{\text{const}} \cdot x^{17} + (\sin x)^2 + \underbrace{\cos^2 y}_{\text{const}} + \underbrace{e^{yx}}_{\text{like } e^{7x}}$$

$$\frac{\partial f}{\partial x} = y^{83} \cdot 17x^{16} + \underbrace{2\sin x \cos x}_{\text{from chain rule}} + 0 + \underbrace{e^{yx} \cdot y}_{\text{from chain rule}}$$

$$= 17x^{16}y^{83} + 2\sin x \cos x + ye^{xy}$$

Similarly,

$$\frac{\partial f}{\partial y} = 83x^{17}y^{82} + 0 + 2\cos y \cdot (-\sin y) + e^{xy} \cdot x$$

$$= 83x^{17}y^{82} - 2\sin y \cos y + xe^{xy}$$