

$$1) \quad f(x, y) = x y y y y \sin(x)$$

$$f(x, 1) = x \sin x$$

$$f_x(x, 1) = \sin x + x \cos x$$

$$2) \quad f(x, y) = (x-3) \sin(\cos(\log(y))) + x y$$

$$f(3, y) = x y$$

$$f_y(3, y) = 3$$

$$f(x, y) = x^3 y + 4x^2 y$$

$$\frac{\partial f}{\partial x} = f_x(x, y) = 3x^2 y + 8xy$$

$$\frac{\partial f}{\partial y} = f_y(x, y) = x^3 + 4x^2$$

$$\frac{\partial^2 f}{\partial x^2} = (f_x(x, y))_x = f_{xx}(x, y) = 6xy + 8y$$

$$\frac{\partial^2 f}{\partial y \partial x} = (f_x(x, y))_y = f_{xy}(x, y) = 3x^2 + 8x$$

$$\frac{\partial^2 f}{\partial x \partial y} = (f_y(x, y))_x = f_{yx}(x, y) = 3x^2 + 8x$$

$$\frac{\partial^2 f}{\partial y^2} = (f_y(x, y))_y = f_{yy}(x, y) = 0$$

$$f(x, y) = x^3 y^2 - \sin(xy)$$

$$f_x(x, y) = 3x^2 y^2 - y \cos(xy)$$

$$f_y(x, y) = 2x^3 y - x \cos(xy)$$

$$f_{xy}(x, y) = 6x^2 y - \cos(xy) + xy \sin(xy)$$

$$f_{yx}(x, y) = 6x^2 y - \cos(xy) + xy \sin(xy)$$

$$f(x,y) = e^{x+y} + xy$$

~~$$f_x(x,y) =$$~~

$$1) \quad f(x,y) = e^{x+y} + xy$$

$$f_x(x,y) = e^{x+y} \cdot 1 + y$$

$$2) \quad f(x,y) = e^{xy} + xy$$

$$f_y(x,y) = e^{xy} + x$$

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$$f(x,y) = \frac{x^3 y}{1} + \frac{y^4 x}{4}$$

$$f_x(x,y) = \frac{3x^2 \cdot y}{1} + \frac{y^4}{4}$$

$$f_y(x,y) = \frac{x^3}{1} + \frac{4y^3 x}{4}$$