Partial Derivatives

The partial derivatives of a function

$f(x,y)$ at the point (a, b) in the

domain of f are:

$f_X(a, b) = \lim\limits_{t \to 0} \dfrac{f(a+t, b) - f(a, b)}{t}$ Partial with respect to X.

$f_Y(a, b) = \lim\limits_{t \to 0} \dfrac{f(a, b+t) - f(a, b)}{t}$ partial wrt Y.

let $g(x) := f(x, b)$ $g'(a) = \lim\limits_{t \to 0} \dfrac{g(a+t) - g(a)}{t} = f_x(a,b)$

let $h(y) := f(a, y)$ $h'(b) = \lim\limits_{t \to 0} \dfrac{h(b+t) - h(b)}{t} = f_y(a,b)$

Example $\qquad e^{(x^2+2y)} = f(x,y)$

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

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