Formulas-2

$\lim_{(x,y)\to(x_0,y_0)} f\left(x,y\right) = L$ if for every ε>0, there exists a corresponding δ>0, such that for all (x,y) in the domain of f, $\left|f\left(x,y\right)-L\right| < \epsilon$ whenever $0 < \sqrt{(x-x_0)^2+(y-y_0)^2} < \delta$

$$\frac{\partial f}{\partial x}|_{(x_0,y_0)} = \lim_{h\to 0}\frac{f\left(x_0+h,y_0\right)-f\left(x_0,y_0\right)}{h} = f_x\left(x_0,y_0\right)$$

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

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

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

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

$$\frac{dw}{dt} = \frac{\partial w}{\partial x}\cdot\frac{dx}{dt}+\frac{\partial w}{\partial y}\cdot\frac{dy}{dt}+\frac{\partial w}{\partial z}\cdot\frac{dz}{dt}$$

$$\frac{dy}{dx} = -\frac{F_x}{F_y}$$

$\$\$\$\$ f'_u\left(x,y\right) = D_u f\left(x,y\right) = \lim_{s\to 0}\frac{f\left(x+su_1,y+su_2\right)-f\left(x,y\right)}{s} = \nabla$