1. Partial derivatives revisited

   Given an n-variable real function, $f : D \to C$, where $D = \{(x_1, x_2, ..., x_n) \mid x_i \in \mathbb{R})\} \subseteq \mathbb{R}^n$, and $C \subseteq \mathbb{R}, n \geq 2$, we will have

$$\frac{\partial f}{\partial x_i}(x_1, x_2, ..., x_n) = \underset{h \to 0}{lim} \frac{f(x_1, x_2, ..., x_i + h, ..., x_n) - f(x_1, x_2, ..., x_i, ..., x_n)}{h}$$

   .

   Examples

2. $\frac{\partial f}{\partial x}(e^{\sin x}y) = e^{\sin x}y. \cos x$, while $\frac{\partial f}{\partial y}(e^{\sin x}y) = e^{\sin x}$.

3. $\frac{\partial f}{\partial x}(z^{\sin x}y) = z^{\sin x}y \ln z. \cos x$, $\frac{\partial f}{\partial y}(z^{\sin x}y) = z^{\sin x}$,while $\frac{\partial f}{\partial z}(z^{\sin x}y) = \sin x. z^{\sin x - 1}.y$.