Partial Derivatives

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May 12, 2024

Definitions

Remember the limit definition of a derivative

- $f'(a) = \lim_{h \to \infty} \frac{f(a+h)-f(a)}{h}$

For notation, we have

- $\frac{df}{dx}$ - full derivative with respect to x
- $\frac{\partial f}{\partial x}$ - partial derivative with respect to x, also written as f_x
- These are almost never the same

So, the limit definition of a partial derivative is given by

- $f_x(x, y) = \lim_{h \to \infty} \frac{f(x+h,y)-f(x,y)}{h}$
- can also be written equivalently for f_y