Definition 0.0.1: Differentierbarhet

$f : \mathbb{R}^2 \to \mathbb{R}$

$$f(x, y) \approx f(a, b) + \nabla f(a, b) \cdot (x - a, y - b)$$

$f : \mathbb{R}^4 \to \mathbb{R}$

$$f(\vec{x}) \approx f(\vec{a}) + \nabla f(\vec{a}) \cdot (\vec{x} - \vec{a})$$

$f : \mathbb{R}^3 \to \mathbb{R}^2$, $n = 3$, $m = 2$

$$\vec{f}(\vec{x}) \approx \vec{f}(\vec{a}) + A \cdot (\vec{x} - \vec{a})$$

Där A definieras som: A =

$$\begin{pmatrix} \frac{\partial f_1}{\partial x_1} & \frac{\partial f_1}{\partial x_2} & \frac{\partial f_1}{\partial x_3} \\ \frac{\partial f_2}{\partial x_1} & \frac{\partial f_2}{\partial x_2} & \frac{\partial f_2}{\partial x_3} \end{pmatrix} (\vec{a})$$