

Cálculo Diferencial e Integral 2 Respostas à Ficha de Trabalho 3

- (a) $\frac{\partial f}{\partial x} = \frac{1}{y}$; $\frac{\partial f}{\partial y} = -\frac{x}{y^2}$.

(b) $\frac{\partial g}{\partial x} = \frac{y}{2(1+xy)}$; $\frac{\partial g}{\partial y} = \frac{x}{2(1+xy)}$.

(c) $\frac{\partial h}{\partial x} = -\frac{4xy^2}{(x^2-y^2)^2}$; $\frac{\partial h}{\partial y} = \frac{4yx^2}{(x^2-y^2)^2}$.
- $\frac{\partial f}{\partial x}(0,0) = 1$; $\frac{\partial f}{\partial y}(0,0) = 0$.
- (a) $\begin{bmatrix} \frac{1}{y} & -\frac{x}{y^2} \\ y & x \end{bmatrix}$

(b) $\begin{bmatrix} 0 & \frac{1}{2}\frac{z}{\sqrt{yz}} & \frac{1}{2}\frac{y}{\sqrt{yz}} \\ yze^{xyz} & xze^{xyz} & xye^{xyz} \end{bmatrix}$

(c) $\begin{bmatrix} 2x & 0 & 0 \\ z & -1 & x \\ 0 & 0 & 4z^3 \end{bmatrix}$

(d) $[2x - yz \quad -xz \quad -xy + 4z^3]$

(e) $\begin{bmatrix} 2t \\ 2e^{2t} \\ -\frac{1}{t^2} \end{bmatrix}$
- (a) 1

(b) e
- $(1, -\frac{2}{3})$ por exemplo.
- Basta ver que $\frac{\partial f}{\partial x}(0,0) = \frac{\partial f}{\partial y}(0,0) = 0$, $\lim_{(x,y) \rightarrow (0,0)} \frac{|f(x,y)|}{\sqrt{x^2 + y^2}} = 0$.
- Apenas a função da alínea iii) é diferenciável na origem.
- (a) $\frac{\partial f}{\partial x}(1,0) = 0$, $\frac{\partial f}{\partial y}(1,0) = 1$

(b) 2

(c) $\frac{1}{2}$