

Cálculo Diferencial e Integral 2

Respostas à Ficha de Trabalho 4

1. $\begin{bmatrix} 2 & -2 \\ 3 & -3 \\ 3 & -3 \end{bmatrix}$

2. $4t^3$.

3. 18.

4. $\begin{bmatrix} 1 \\ 4 \\ 7 \end{bmatrix}$

5. a) 1.

b) 2.

6.

$$\frac{\partial g}{\partial u}(c) \left[e^x + 2x \frac{\partial g}{\partial u}(a) + y \frac{\partial g}{\partial v}(a) + \frac{\partial g}{\partial w}(a) \right] + y \frac{\partial g}{\partial v}(c) + \frac{\partial g}{\partial w}(c) \left[\frac{\partial g}{\partial u}(b) + \frac{\partial g}{\partial v}(b) + \frac{\partial g}{\partial w}(b) \right]$$

onde $g = g(u, v, w)$ e

$$a = (x^2, xy, x+y), \quad b = (x, x, x), \quad c = (g(x^2, xy, x+y) + e^x, xy, g(x, x, x)).$$

7. $Dg(x, y) = \left[\begin{array}{cc} -\frac{\partial F}{\partial x}(x, y, g(x, y)) & -\frac{\partial F}{\partial y}(x, y, g(x, y)) \\ \frac{\partial F}{\partial z}(x, y, g(x, y)) & \frac{\partial F}{\partial z}(x, y, g(x, y)) \end{array} \right]$

8. Recta tangente: $\{(1, 1, 0) + t(1, 0, 1) : t \in \mathbb{R}\}$; Plano normal: $x + z = 1$.

9. Recta normal: $\{(0, 1, 0) + t(0, 2, 1) : t \in \mathbb{R}\}$; Plano tangente: $2y + z = 2$.