

### Atividade 6

① Determine as derivadas parciais de primeira ordem das funções:

a)  $f(x, y) = x^4 y^3 + 8x^2 y$

$$(i) \frac{\partial f}{\partial x}(x, y) = 4x^3 y^3 + 16xy$$

$$(ii) \frac{\partial f}{\partial y}(x, y) = 3x^4 y^2 + 8x^2$$

b)  $f(x, t) = \sqrt{x} \ln(t)$

$$(i) \frac{\partial f}{\partial x}(x, t) = \frac{1}{2\sqrt{x}} \ln(t)$$

$$(ii) \frac{\partial f}{\partial t}(x, t) = \sqrt{x} \cdot \frac{1}{t}$$

c)  $f(x, y) = \frac{x}{(x+y)^2} = \frac{x}{x^2 + 2xy + y^2}$

$$(i) \frac{\partial f}{\partial x}(x, y) = \frac{1 \cdot (x+y)^2 - x \cdot (2x + 2y)}{(x+y)^4}$$

$$\frac{\partial f}{\partial x}(x, y) = \frac{x^2 + 2xy + y^2 - 2x^2 - 2xy}{(x+y)^4}$$

$$\frac{\partial f}{\partial x}(x, y) = \frac{-x^2 + y^2}{(x+y)^4} = \frac{(y+x)(y-x)}{(x+y)^4}$$

$$\boxed{\frac{\partial f}{\partial x}(x, y) = \frac{-x+y}{(x+y)^3}}$$

$$(ii) \frac{\partial f}{\partial y}(x, y) = \frac{0 \cdot (x+y)^2 - x(2x + 2y)}{(x+y)^4}$$

$$\frac{\partial f}{\partial y}(x, y) = \frac{-2x \cdot (x+y)}{(x+y)^4}$$

$$\boxed{\frac{\partial f}{\partial y}(x, y) = \frac{-2x}{(x+y)^3}}$$