Lista 9

1) a) $f(x,y) = y^5 - 3xy$

$f_x = 0 - 3y = -3y$ / $f_y = 5y^4 - 3x$

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

$f(x) = 4x^3y^3 + 16xy$ / $f_y = 3x^4y^2 + 8x^2$

c) $f(x,\pi) = e^{-y}\cos(\pi x)$

$f_x = -\sin(x\pi)\pi = -\pi e^{-y}\sin(\pi x)$

$f_y = -\cos(x\pi)e^{-y}$

d) $f(x,y) = \sqrt{x}\ln(y)$ $\quad f_x = \ln(y)\frac{x^{-\frac{1}{2}}}{2} = \frac{\ln(y)}{2\sqrt{x}}$

$f_y = \sqrt{x}\frac{1}{y} = \frac{\sqrt{x}}{y}$

e) $z = (2x+3y)^{10}$ $\quad f_x = 10(2x+3y)^9 2 = 20(2x+3y)^9$

$f_y = 0$

f) $f(x,y) = \tg(xy)$ $\quad f(x) = \sec^2(xy)y = y\sec^2(xy)$

$f_y = \sec^2(xy)x = x\sec^2(xy)$

g) $f(x,y) = \frac{x}{y}$ $\quad f_y = x\,y^{-1} = -xy^{-2} = -\frac{x}{y^2}$

$f_x = \frac{x^{-1}}{y} = \frac{1}{y}\frac{d}{dx}(x) = \frac{1}{y}$

h) $f(x,y) = \frac{x}{(x+y)^2}$ $\quad f_x = \frac{1}{2(x+y)}$

$f_y = \frac{x}{2(x+y)}$

(2) $f(x,y) = x^4y^2 - x^3y$

$f_x = 4x^3y^2 - 3x^2y$ $\quad f_y = 2x^4y - x^3y$

$f_{xx} = 12x^2y^2 - 6xy$ $\quad f_{yy} = 2x^4$

b) $f(x,y) = \operatorname{sen}(2x+5y)$

$f_x = 2\cos(2x+5y)$ $\quad f_y = 5\cos(2x+5y)$

$f_{xx} = -4\operatorname{sen}(2x+5y)$ $\quad f_{yy} = -25\operatorname{sen}(2x+5y)$