

MATH 253 – WORKSHEET 8
PARTIAL DERIVATIVES

1. DIFFERENTIATE THE FOLLOWING FUNCTIONS

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

(a) $f_x =$

(b) $f_y =$

(2) Let $z = \sqrt{1 - x^2 - y^2}$.

(a) $\frac{\partial z}{\partial x} =$

(b) Use $\frac{\partial}{\partial x} (x^2 + y^2 + z^2) = \frac{\partial}{\partial x} (1) = 0$ to find $\frac{\partial z}{\partial x}$ a different way.

(3) $g(x, y) = \ln(x^2 + y^2)$

(a) $g_x =$

$g_y =$

(b) $g_{xx} =$

$g_{xy} =$

(c) $g_{yx} =$

$g_{yy} =$

(d) $\Delta g = g_{xx} + g_{yy} =$