

Name _____ I.D.# _____ Serial

Q1 Let $f(x,y,z) = y^{\frac{2}{3}} \sin z \ln x$, find f_x, f_y, f_z .

Q2 Use total differential to estimate the change as the function $f(x,y,z) = 3x^2y - 2xz^2 + 3y^2z$ varies from the point $P(1,2,1)$ to the point $Q(1.02,2.03,0.95)$..

Q3 Let $z = \cos(x^2 + y^2)$, $f(x^2 + y^2) = y^2$, show that $y \frac{z}{x} = x \frac{z}{y} + 4xy \sin(x^2 + y^2)$