9/30/20 Lecture 9 PDF Quiz.

1) $f(x,y) = x^2 + 2xy^2 + 2y^3$

$\frac{df}{dx} = 2x + 2y^2$

$\frac{df}{dy} = 4xy + 6y^2$

$x = r + 2s$ $\quad \frac{dx}{dr} = 1$ $\quad \frac{dx}{ds} = 2$

$y = 3r + ds$ $\quad \frac{dy}{dr} = 3$ $\quad \frac{dy}{ds} = 2$

$\frac{df}{dr} = \frac{df}{dx} \cdot \frac{dx}{dr} + \frac{df}{dy} \cdot \frac{dy}{dr} = (2x + 2y^2) + (4xy + 6y^2)$

$\frac{df}{ds} = \frac{df}{dx} \cdot \frac{dx}{ds} + \frac{df}{dy} \cdot \frac{dy}{ds} = 2(2x + 2y^2) + 2(4xy + 6y^2)$

(2) $x^2 + y^2 + z^2 = 5xyz + 1$

$\frac{dz}{dx}$

$2x = 5(xyz)'$

$2x = y \frac{dz}{dx}$

$\frac{2x}{5y} = \frac{dz}{dx}$

$\frac{dz}{dy}$

$2y = 5(xyz)'$

$2y = 5x\left(\frac{dy}{dz}\right)$

$\frac{dy}{dz} = \frac{2y}{5x}$

Scanned with CamScanner