

Taker Name:

Key

GTID: 90

Section:

Grader #1:

GTID: 90

PA#3A- §14.3: Partial derivatives

Find the total derivative Df of the function $f(r, s, t) = \begin{bmatrix} r^2s + \ln(1 + 3t) \\ s \sec(rt) \end{bmatrix}$.

$$x(r, s, t) = r^2s + \ln(1 + 3t)$$

$$y(r, s, t) = s \sec(rt)$$

$$Df = \begin{bmatrix} x_r & x_s & x_t \\ y_r & y_s & y_t \end{bmatrix}$$

$$x_r = 2rs + 0 = 2rs$$

$$x_s = r^2 + 0 = r^2$$

$$x_t = 0 + \frac{1}{1+3t} * 3 = \frac{3}{1+3t}$$

$$y_r = ts \sec(rt) \tan(rt)$$

$$y_s = \sec(rt)$$

$$y_t = s \sec(rt) \tan(rt)$$

So

$$Df = \begin{bmatrix} 2rs & r^2 & \frac{3}{1+3t} \\ ts \sec(rt) \tan(rt) & \sec(rt) & s \sec(rt) \tan(rt) \end{bmatrix}$$

A

J

N

G2:

A

J

N

G3:

A

J

N