Homework/ Partial Derivatives

Q1/ / Evaluate ***dw/dt*** by using the Chain Rule if

$$\boldsymbol{w = cos(xy) + z, \quad x = \pi e^{t}, \quad y = e^{-t}, z = t^{2}}$$

Q2/ Find all the second order derivatives for :

$$\boldsymbol{f(x,y) = \frac{x^{4}}{2y} + e^{2x}\sin(y)}$$

Q3/ Find all the local maxima, local minima, and saddle points of the function:

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

Q4/ Find all the local maxima, local minima, and saddle points of the function:

$$\boldsymbol{f(x,y) = x^{3} + y^{3} - 6y^{2} - 3x + 9}$$

Q5/ / Evaluate ***dw/dt*** by using the Chain Rule if

$$\boldsymbol{w = tan^{-1}\left(\frac{y}{x}\right), \quad x = e^{t}, \quad y = 1 - e^{t}}$$

Q6/ Evaluate $\frac{\partial z}{\partial u}$ and $\frac{\partial z}{\partial v}$ at the given point $(u, v)$for

$$\boldsymbol{z = e^{xy} \quad , \quad x = 2u + v \quad , \quad y = \frac{u}{v}}$$

Q7/ Find the absolute maxima and minima of the function on D, where D is the closed rectangular plate. $\boldsymbol{D = \{0 \leq x \leq 2,\ 0 \leq y \leq 3\}}$

$$\boldsymbol{f(x, y) = 2x^2 - 4x + y^2 - 4y + 1}$$

Q8/ Find the absolute maxima and minima of the function on D, where D is the closed triangular region with vertices (-2,0), (2,0), and (0,-2).

$$\boldsymbol{f(x, y) = x^2 + y^2 - 2y}$$