



Bilkent University

Quiz # 08
Math 102 Section 08 Calculus II
1 April 2024 Monday
Instructor: Ali Sinan Sertöz



Name & Lastname:

Department:

Student ID:

Q-1) Consider the equation $3x^4 - 2x^2y + y^2z + xyz^3 = 65$ which defines z as a differentiable function of x and y .

(i) Find the value of $z(1, 2)$.

Hint: $t^3 + 2t - 33 = (t^2 + 3t + 11)(t - 3)$.

(ii) Calculate $\left. \frac{\partial z}{\partial x} \right|_{(1,2)}$ and $\left. \frac{\partial z}{\partial y} \right|_{(1,2)}$

(iii) Write the linearization of $z(x, y)$ at the point $(x, y) = (1, 2)$ in the form $L(x, y) = Ax + By + C$, where A, B and C are rational numbers.

(iv) Calculate $L\left(\frac{3}{2}, \frac{3}{2}\right)$.

Note: The difference between $L\left(\frac{3}{2}, \frac{3}{2}\right)$ and $z\left(\frac{3}{2}, \frac{3}{2}\right)$ is $0.0032\dots$

Show your work in detail. Correct answers with no justification will not get any credit.

Grading: 1+4+3+2=10 points

Solution: (Grader: melis.gezer@bilkent.edu.tr)