MATH 2551-GT-E– Multivariable Calculus

Summer 2025



You have 15 minutes to take the quiz. No phones, notes, or use aids of any kind is permitted.

1. (4 points) [Directional Derivative] Find the derivative of the function at P in the direction of **u**. [AJN]

 $f(x, yz,) = x^2 + 2y^2 - 3z^2$, and $\mathbf{u} = \mathbf{i} + 2\mathbf{j} + \mathbf{k}_{\mathbf{f}}$

- - 2. (6 points) [Tangent Planes and Linearization] Find the linearization of the function at the given point. [AJN]

$$f(x,y) = e^{2x-y}$$
, at $Q(1,2)$.

Formule: L(x,y) = f(Q) + fr(Q)(x-xo) + fy(Q)(y-yo)

 $\nabla f = \langle 2e^{2x-y}, -e^{2x-y} \rangle$ $\nabla f(Q) = \langle 2e^{0}, -e^{0} \rangle = \langle 2, -1 \rangle = f(Q) = e^{0} = 1.$ So $\int (x,y) = 1 + z(x-1) - (y-2)$