

Math 233 - Quiz 7

March 24, 2022

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary. This quiz is due March 29.

1. (2 points) Use differentials to estimate the change in $f(x, y, z) = x^2 \ln(5yz + 1)$ as (x, y, z) changes from $(2, 1, 3)$ to $(1.99, 1.02, 3.05)$.

2. (3 points) Use the **definition of differentiability** to show that $f(x, y) = y^2 - xy + 5x$ is differentiable everywhere on $\mathbb{R}^2$.

Turn over.

3. (2.5 points) Find the linearization of $f(x, y) = \sqrt{1 + x - y^2}$ at $(4, 1)$, and then use it to approximate $f(3.96, 1.02)$.

4. (2.5 points) Find an equation of the plane tangent to the graph of $g(x, y) = 3e^{y^2 - x^2}$ at the point where $(x, y) = (2, 2)$.