Functions of Several Variable and Differential Geometry 2024 - Minor 1(Repeat)

Each question carries 4 marks.

1. Let G be the derivative of $f : \mathbb{R}^2 \to \mathbb{R}$ at $(x, y) = (1, 0)$, where $f(x, y) = 3x$. Compute $G(1, 0)$.
2. State true or false with justification: A function is differentiable at a point if its all directional derivative exist at that point.
3. State inverse function theorem. Explain the importance of assuming the continuity of the derivative of the function by giving a counter example.

4 Prove or disprove: Contraction maps are continuous.

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