Math 233 - Quiz 8

Name _____

April 2, 2026

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) Let $g(x, y, z) = \sqrt{3x^2 + y^2 - 2z^2}$. Compute $g_z(1, -2, 1)$.

2. (2 points) Suppose you are given a function $f(x, y)$. State the conditions under which we should expect that $f_{xy}(x, y) = f_{yx}(x, y)$.

3. (5 points) The volume V of a right circular cone of radius r and height h is given by $V = \frac{1}{3}\pi r^2 h$. Suppose that the height decreases from 20 in to 19.95 in, while the radius increases from 4 in to 4.06 in. Find the total differential, dV. Then use differentials to approximate the change in volume.