Math 233 - Quiz 11

Name _____

November 20, 2025

Score _____

Show all work to receive full credit. Supply explanations when necessary. Use other paper as necessary. This quiz is due December 2.

1. (2 points) Use Lagrange multipliers to find the extreme values of $f(x, y) = y^2 - 4x$ subject to $x^2 + y^2 = 9$.

2. (3 points) Sketch the region of integration, reverse the order of integration, and evaluate both iterated integrals.
$$\int_{-2}^{1} \int_{x^2+4x}^{3x+2} dy\, dx$$

3. (2.5 points) Let E be the plane region in the xy-plane between the graphs of $y = 4 - x^2$ and $y = 3x$. Sketch the region E and evaluate the double integral $\iint_E (x + 4)\, dA$.

4. (2.5 points) Use a double integral to find the volume of the space region under the graph of $z = x + y + 2$ and over the triangle in the xy-plane with vertices at $(0, 0)$, $(0, 1)$, and $(1, 1)$.