MATH 201 QUIZ 4

1. (15 points) Use the Lagrange multiplier method to find the minimum and maximum of the function $f(x,y) = e^{xy}$ under the constraint condition $x^2 + y^4 = 3$. Find also the minimum and maximum of f on the region $D = \{(x,y) : x^2 + y^4 \leq 3\}$.

2. (10 points) Let $D = \{(x,y) : 0 \leq x \leq 1, 0 \leq y \leq 1\}$. Compute

$$\iint_D \frac{1+x^2}{4-y^2}\, dA.$$

3. (15 points) Reversing the order of integration, compute

$$\int_0^1 \int_{\sqrt{x}}^1 e^{x/y^2}\, dydx.$$