Math 001D Assignment 14.8 Ans_____

Instructions: Write complete solutions to the following problems in the space provided. Be sure to supply all the necessary steps that lead to your answers

1. Use Lagrange multipliers to find the maximum and minimum values of the function subject to the given constraint. (If an answer does not exist, enter DNE.)

$f(x, y) = y^2 - x^2; \quad x^2 + 4y^2 = 196$

2. Use Lagrange multipliers to find the maximum and minimum values of the function subject to the given constraint. (If an answer does not exist, enter DNE.)

$f(x, y, z) = 6x + 10y + 8z; \quad x^2 + y^2 + z^2 = 50$

3. Find the extreme values of f subject to both constraints. (If an answer does not exist, enter DNE.)

$$f(x, y, z) = 3x - y - 3z; \quad x + y - z = 0, \quad x^2 + 2z^2 = 3$$

4. Use Lagrange multipliers to find the dimensions of a rectangular box with largest volume if the total surface area is given as 400 cm2.