

Name: \_\_\_\_\_

- No electronic devices are allowed. You must show your work to obtain credit.
  - You may use the back if necessary. Please indicate clearly if you do so.
1. (5 points) Use Lagrange multipliers to find the maximum and minimum values of the function subject to the given constraint:

$$f(x, y, z) = x + y + z; \quad x^2 + y^2 + z^2 = 1.$$

2. (5 points) Find the volume of the solid that lies under the hyperbolic paraboloid  $z = 4y^2 - x^2 + 1$  and above the rectangle  $R = [0, 1] \times [1, 2]$ .