

Score: _____

Name: _____

Worksheet 5 - Section 14.8, 15.2, 15.3 (Due Tues, Oct 28)

Math 2110Q – Fall 2014

Professor Hohn

You must show all of your work to receive full credit!

1. Use Lagrange multipliers to find the maximum and minimum values of

$$f(x, y, z) = xyz$$

subject to the constraint

$$x^2 + y^2 + z^2 = 3.$$

2. Find the volume of the solid enclosed by the surface $z = 1 + e^x \sin y$ and the planes $x = \pm 1$, $y = 0, y = \pi$, and $z = 0$.

3. Find the volume of the solid bounded by the planes $z = x$, $y = x$, $x + y = 2$, $x = 0$, and $z = 0$.

4. Evaluate the integral

$$\int_0^4 \int_{\sqrt{x}}^2 \frac{1}{y^3 + 1} dy dx$$

by reversing the order of integration.