Homework 2

Math 324F
Advanced Multivariable Calculus
Due on 14th October 2015

Problem 15.7.12 (6 points) Evaluate $\iiint_E \sin y \, dV$, where E lies below the plane $z = x$ and above the triangular region with vertices $(0,0,0), (0,\pi,0)$ and $(\pi,0,0)$.

Problem 15.7.22 (6 points) Use a triple integral to find the volume of the solid enclosed by the cylinder $x^2 + z^2 = 4$ and the planes $y = -1$ and $y + z = 4$.

Problem 15.7.36 (6 points) Write 5 other iterated integrals that are equal to $\int_0^1 \int_y^1 \int_0^z f(x,y,z)\, dx dz dy$

Problem 15.8.21 (6 points) Evaluate $\iiint_E x^2 \, dV$ where E is the solid that lies within the cylinder $x^2 + y^2 = 1$, above the plane $z = 0$, and below the cone $z^2 = 4x^2 + 4y^2$.

Problem 15.8.24 (6 points) Find the volume of the solid that lies between the paraboloid $z = x^2 + y^2$ and the sphere $x^2 + y^2 + z^2 = 2$.