MATH 253 – WORKSHEET 18
MORE LAGRANGE MULTIPLIERS

(1) A large rectangular box without lid is made with 12m^2 of wood. What is the largest possible volume?

(2) Find the angle between the plane $x + 2y + z = 4$ and the line parametrized by $\left(\frac{4}{3}, \frac{2}{3}, \frac{4}{3}\right) + t\left\langle -1, 1, 2\right\rangle$ where $\left(\frac{4}{3}, \frac{2}{3}, \frac{4}{3}\right)$ lies on the plane.

(3) The plane $x + y + 2z = 2$ intersects the paraboloid $z = x^2 + y^2$ in an ellipse. Find the points on this ellipse closest nearest and farthest from the origin.