

Your name:

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Math 11 Fall 2015, Homework 5, due Wed Oct 21

Please show your work. No credit is given for solutions without work or justification.

- (1) Use the method of Lagrange multipliers to find the maximum volume of a rectangular solid that has one corner at the origin and the opposite corner on the plane $x + \frac{y}{2} + \frac{z}{3} = 3$.

(2) (a) Calculate the integral

$$\iint_{\mathcal{R}} \frac{2x+3}{2y+2} dA$$

for $\mathcal{R} = [0, 1] \times [2, 4]$.

(b) Integrate the function $f(x, y) = xy + 2$ over the domain \mathcal{D} that is a triangle in the xy -plane with vertices $(1, 1)$, $(2, 0)$, and $(0, 0)$.

- (3) (a) Rewrite the integral with the order of integration reversed. *Do not evaluate the integral.*

$$\int_0^9 \int_{\sqrt{x}}^3 (x + \ln(y)) dy dx$$

(*Hint:* It will help to draw the region of integration.)

- (b) Find the volume of the solid in the first octant bounded by the surface $z = 16 - x^2$ and the plane $y = 3$.