

Homework 2

Due date: April 7, 2017

Problem 1: Estimate the volume of the solid that lies below the surface $z = 1 + x^2 + 3y$ and above the rectangle $\mathcal{R} = [1, 2] \times [0, 3]$ by a Riemann sum with $N = M = 2$ and sample points the lower left corners. (Draw a picture).

Problem 2: Calculate the following two integrals.

(a) $I_1 = \iint_{\mathcal{R}_1} \frac{xy^2}{x^2 + 1} dA$, where $\mathcal{R}_1 = [0, 1] \times [-3, 3]$

(b) $I_2 = \iint_{\mathcal{R}_2} \frac{x}{1 + xy} dA$, where $\mathcal{R}_2 = [0, 1] \times [0, 1]$

Problem 3: Evaluate the integral

$$\iint_{\mathcal{D}} xy dA$$

where \mathcal{D} is the region bounded by the line $y = x - 1$ and the parabola $y^2 = 2x + 6$.