

## Math 13 Homework #1

- (1) Evaluate the integral

$$\iint_{\mathcal{R}} (xy + y) dA$$

where  $\mathcal{R} = [2, 4] \times [1, 3]$ .

- (2) Evaluate the iterated integral

$$\int_{x=0}^{\pi} \int_{y=0}^1 x \cos(xy) dy dx.$$

- (3) Find the value of  $b > 0$  such that

$$\int_{x=0}^b \int_{y=0}^2 3x^2 y dy dx = 16.$$

- (4) (a) Sketch the region  $\mathcal{D}$  bounded by  $y = x$ ,  $y = 4x - x^2$ , and  $y = 0$ .

- (b) Integrate

$$\iint_{\mathcal{D}} x dA,$$

where  $\mathcal{D}$  is a vertically simple region.

- (5) Calculate the average value of the  $x$ -coordinate of a point on the semicircle  $x^2 + y^2 \leq R^2$ ,  $x \geq 0$ .