

**Math 2415**  
**Paper Homework #10**

1. **15.1: Double Integrals over Rectangles:** Let  $V$  be the volume of the solid above the rectangle  $[2, 4] \times [0, \pi]$  and below the surface  $z = f(x, y) = x \ln(x^2) \sin(y)$ .
  - (a) Estimate  $V$  using a Riemann sum with 4 equal sized rectangles and evaluate  $f$  at the midpoints of the rectangles.
  - (b) Set up an iterated double integral for  $V$ .
  - (c) Evaluate this integral.
2. **15.2:** Set up an iterated integral for  $\iint_D (6x + 3y^2) dA$  where  $D$  is the domain bounded by the parabola  $x = y^2$  and the line  $x + y = 4$ . (You do not need to evaluate the iterated integral.)
3. **15.2:** Sketch the solid bounded by the planes  $x = 0$ ,  $y = 0$ ,  $x + 2y = 2$ ,  $z = 0$ , and  $2x + 4y + z = 8$  and use a double integral to find its volume.
4. **15.2:** Calculate  $\int_{y=0}^{y=2} \int_{x=y}^{x=2} e^{-x^2} dx dy$ . **Hint:** Reverse the order of integration.