

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.