

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 6 equal sized rectangles and evaluate f at the bottom left corner 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 $\iint_D (6x + 3y) \, dA$ where D is the domain bounded by the parabola $y = x^2$ and the line $x + 2y = 6$.
3. **15.2:** Let D be the triangular domain in the (x, y) -plane with vertices $(0, 0)$, $(2, 0)$ and $(0, 1)$. Sketch the solid that is above D and below the plane $2x + 4y + z = 8$. Use a double integral to find the volume of this solid.
4. **15.2:** Calculate $\int_{x=0}^{x=2} \int_{y=x}^{y=2} e^{-4y^2} \, dy \, dx$. **Hint:** Reverse the order of integration.