

## Calculus III, Worksheet #9

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1. Sketch the region and change the order of integration:

$$\int_{-2}^2 \int_0^{\sqrt{4-y^2}} f(x,y) dx dy$$

2. Evaluate

$$\iint (x^2 + 2y) dA$$

Over the region  $D$  which is bounded by  $x = 0$ ,  $y = x$  and  $y = x^3$ .

3. Evaluate  $\int_0^2 \int_0^\pi r \sin^2 \theta d\theta dr$ .

4. Evaluate  $\int \int_R \frac{xy^2}{x^2+1} dA$ , where  $R = \{(x,y) | 0 \leq x \leq 1, -3 \leq y \leq 3\}$ .

5. Find the volume of the solid in the first octant bounded by the cylinder  $z = 16 - x^2$  and the plane  $y = 5$ .

6. Set up iterated integrals for both orders of integration of  $\int \int_D y^2 e^{xy} dA$ , where  $D$  is bounded by  $y = x$ ,  $y = 4$  and  $x = 0$ .