

Calculus III, Worksheet #9

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 $x = 0$.