

Assignment 5

April 7, 2017

1. Find the mass M of a metal plate R bounded by $y=x$ and $y = x^2$, with density given by $f(x, y) = 1 + xy$ kg/meter².
2. Evaluate $\int_R \sin(x^2 + y^2) dA$ where R is the disk of radius 2 centered at the origin.
3. Evaluate $\int_R (x^2 - y^2) dA$, where R is the most quadratic region between the circles of radius 1 and radius 2.
4. Evaluate $\int_D 5x^2y - y^3 dA$, where D is a region bounded by $y = \sqrt{x}$ and $y = x^3$.
5. Evaluate the tripple integral in spherical coordinates $f(\rho, \theta, \phi) = \sin \phi$, over the region $0 \leq \theta \leq 2\pi$, $0 \leq \phi \leq \frac{\pi}{4}$, $1 \leq \rho \leq 2$.
6. Evaluate the tripple integral in cylindrical coordinates $f(x, y, z) = x^2 + y^2 + z^2$, W is the region $0 \leq r \leq 4$, $\frac{\pi}{4} \leq \theta \leq \frac{3\pi}{4}$, $-1 \leq z \leq 1$.