Lecture on Jul. 13th, 2017: Multivariable Calculus II: Double Integrals II

1 Warm-up Practice

- Find the volume of the solid under the graph of $f(x,y) = e^{-x-y}$ over the rectangular region $R = \{(x,y)|0 \leq x \leq 1, 0 \leq y \leq 1\}$

2 Double Integrals over Regular Regions

- Definition of Double Integrals over Regular Regions.
- Example: Evaluate $\int\int_R 1dA$ over the region $R = \{(x,y)|0 \leq x \leq 2, x-2 \leq y \leq 4-x^2\}$.
- Example: The region R is bounder by the graphs of $x+y=1$, $y=0$, $x=0$. Find the volume of the solid under the graph $z = 1-x-y$ over the region R.
- Example: Evaluate the integral $\int_0^2 \int_{x^3}^{4x}(1+2y)dydx$, graph the region of integration, reverse the order of integration and then evaluate the integral with the order reversed.