Lyell C Read CH 13.1 – REVIEW 11/6/2018

13.1 Double Integrals over Rectangular Areas

- To compute $\int_c^d \int_a^b f(x,y)\,dx\,dy$ first evaluate $\int_a^b f(x,y)\,dx$, then substitute that into $\int_c^d \left[F(x,y)\right]_a^b dy$ where $F(x,y) = \int f(x,y)$
- Notation: $\iint_R f(x,y)$ on $\{(x,y) : a \le x \le b,\ c \le y \le d\}$ just means:

  → $\int_a^b \int_c^d f(x,y)\,dy\,dx$ WHICH IS EQUAL TO $\int_c^d \int_a^b f(x,y)\,dx\,dy$

- Average Function Value: $\frac{1}{\text{Area of rectangle}} \cdot \iint_R f(x,y)$ on {rectangle}
- Average Square distance: $\frac{1}{\text{area of rectangle}} \cdot \iint_R f(x,y)$ on {rectangle} where

  $f(x,y) = d^2 = (x_1 - x_2)^2 + (y_1 - y_2)^2$ (Distance Function, Squared)