Properties of Double Integral

Thm A Integrability thm

If f is bounded on the closed rectangle R and if it is continuous there except on a finite number of smooth curves, then f is integrable on R (the double integral exists)

Corollary f is continuous on a closed Rect $\Rightarrow$ Integrable

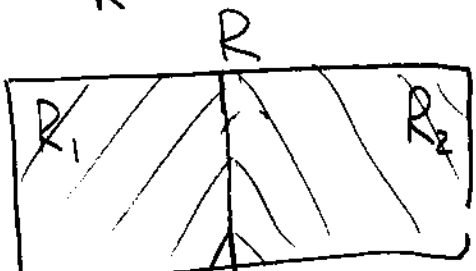
Properties

linearity property

$$\iint_R Kf(x,y)\,dA = K \iint_R f(x,y)\,dA$$

$$\sum_i k\,d_i = k \sum_i d_i$$

$$\iint_R [f(x,y)+g(x,y)]\,dA = \iint_R f(x,y)\,dA + \iint_R g(x,y)\,dA$$



$$\sum (b_i + d_i) = \sum b_i + \sum d_i$$

Additivity property

$$\iint_R f(x,y)\,dA = \iint_{R_1} f(x,y)\,dA + \iint_{R_2} f(x,y)\,dA$$

$$\sum_{i=1}^{100} d_i = \sum_{i=1}^{50} d_i + \sum_{i=51}^{100} d_i$$

Comparison Property

$$\iint_R f(x,y)\,dA \le \iint_R g(x,y)\,dA \quad \text{if } f(x,y) \le g(x,y)$$