

Lec. 22 - examples of Integrable functions

Thursday, June 6, 2024 10:22 PM

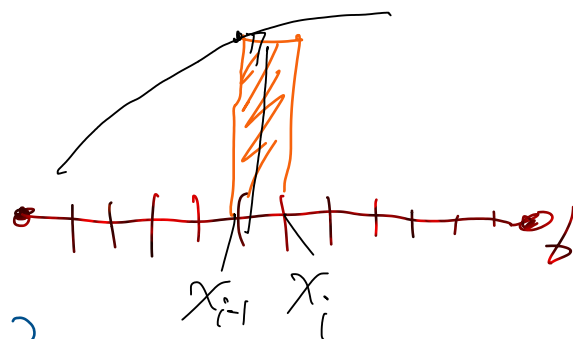
Pages 143-149

Concrete examples of $L(P; f)$ & $U(P; f)$, $L=U$

1st
Defⁿ: (Cauchy)

$$f \in C^0([a, b])$$

$$P_n = \{x_0 = a < x_1 < \dots < x_n = b\}$$



$$S_{P_n}(f) := \sum_{i=1}^n \underbrace{f(x_{i-1})}_{\text{plug in } x_{i-1}} (x_i - x_{i-1})$$

'Sum of areas of little rectangles'

2nd
Defⁿ: (Riemann)

$$f: [a, b] \rightarrow \mathbb{R} \text{ only assume to be bounded}$$

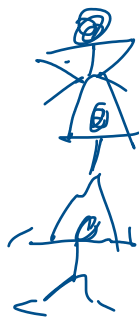
Riemann "samples" $f(\xi_i) \in [x_{i-1}, x_i]$

Lec. 23

Darboux Integrability \equiv Riemann's Integrability

$$\mathcal{D}([a, b]) = \left\{ f: [a, b] \rightarrow \mathbb{R} \mid U(f) = L(f) \right\}$$

1 Cauchy } cartoon history
2 Riemann }
3 Darboux }



Back to the show.