

Lec. 25-a-first half of Lebegues character

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Lebegues characterization of Riemann integrable

(I)

$$[c, d] = I, \quad \overset{\circ}{I} = (c, d)$$

$$l(I) = l(\overset{\circ}{I}) := (d - c)$$

The notation of a set of measure zero 'null set'

$$S \subseteq [a, b]$$

Defn: S has measure zero, provided that

$\forall \epsilon > 0 \quad \exists$ countable collection $\overset{\circ}{I}_j \subseteq [a, b]$

$$\text{st. } \left\{ \begin{array}{l} S \subseteq \bigcup_{j=1}^{\infty} \overset{\circ}{I}_j \\ \sum_{j=1}^{\infty} l(\overset{\circ}{I}_j) < \epsilon \end{array} \right.$$