$F\{I\} = \sum F\{I_k\}$ for every partitioning of I into countably many intervals

F is σ-additive

Step function:

$$E(u) = a_1 F\{I_1\} + \quad \cdot \quad a_n F\{I_n\}$$

$E(u)$ satisfies:

α) additivity

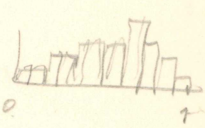
$$E(\alpha_1 u_1 + \alpha_2 u_2) = \alpha_1 E(u_1) + \alpha_2 E(u_2)$$

β) Positive:

$$u \geq 0 \text{ implies } E(u) \geq 0$$

γ) Norming $\quad E(1) = 1$

Riemann integration: $u_n \to u$ uniformly



$E(u) = \lim E(u_n)$

uniformity not necessary

$E(u)$ can therefore be extended to all Baire functions. (bounded)

The number $E(u)$ is defined is the Lebesgue Stieltjes integral of u with respect to F,