Lebesgue Integration and Probabilities

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1 Measures on a product space

1.1 Product of measurable spaces

Def 1.1 (Product of measurable spaces).
$(E_1, \mathcal{E}_1), \ldots, (E_n, \mathcal{E}_n)$*: measurable sp.*
Then

$$\mathcal{E}_1 \times \cdots \times \mathcal{E}_n \coloneqq \sigma(\{A_1 \times \cdots \times A_n \mid A_i \in \mathcal{E}_i, i = 1, \ldots, n\}) \tag{1}$$

is a σ*-algebra on* $E_1 \times \cdots \times E_n$*.* $(E_1 \times \cdots \times E_n, \mathcal{E}_1 \times \cdots \times \mathcal{E}_n)$ *is called the product of measurable spaces.*