Contents

Abbreviations

- $\mathbb{N} = \{1, 2, 3, ...\}$
- $\mathbb{N}_0 = \{0, 1, 2, 3, ...\}$
- $\mathbb{R} = (-\infty,\ \infty)$
- $\mathbb{R}^+ = \mathbb{I} = (0,\ \infty)$
- $\mathbb{R}^n = \mathbb{R} \times \mathbb{R} \times ...... \times \mathbb{R}$ *(n-times)*
- $\|x\|^2 = \sum x_i^2$
- $D_x \equiv \frac{\partial}{\partial x}$
- $\mathbb{R}_+^{n+1} = \mathbb{R}^n \times (0, \infty)$
- $\mathbb{N}_0^{n+1} = \mathbb{N}_0 \times \mathbb{N}_0 \times .... \times \mathbb{N}_0$ *(n+1- times)*
- $\mid x \mid = \sum_i x_i$
- $x = (x',\ x_{n+1}) = (x_1,\ x_2,\ x_3, ..., x_n,\ x_{n+1}) \in \mathbb{R}_0^{n+1}$
- $-x = (-x',\ x_{n+1}) = (-x_1,\ -x_2,\ -x_3, ..., -x_n,\ x_{n+1}) \in \mathbb{R}_0^{n+1}$
- $\xi = (\xi',\ \xi_{n+1}) = (\xi_1,\ \xi_2, ..., \xi_n,\ \xi_{n+1}) \in \mathbb{C}^{n+1}$
- $-\xi = (-\xi',\ \xi_{n+1}) = (-\xi_1,\ -\xi_2, ..., -\xi_n,\ \xi_{n+1}) \in \mathbb{C}^{n+1}$
- $\langle x,\ \xi \rangle = \sum_{k=1}^{n+1} x_k \xi_k$
- $\mid \xi \mid^2 = \sum_{k=1}^{n+1} \xi_k^2$
- $D^\alpha = D_1^{\alpha_1} D_2^{\alpha_2} .....D_n^{\alpha_n} D_{n+1}^{\alpha_{n+1}},\ \alpha \in \mathbb{N}_+^{n+1}$
- $x^m = x_1^{m_1} x_2^{m_2} ....x_n^{m_n} x_{n+1}^{m_{n+1}}, m \in \mathbb{N}_0^{n+1}$
- $\alpha! = \alpha_1!\ \alpha_2!......\alpha_{n+1}!$ for $\alpha \in \mathbb{N}_0^{n+1}$
- $\binom{\alpha}{\beta} = \binom{\alpha_1}{\beta_1}\binom{\alpha_2}{\beta_2}.......\binom{\alpha_n}{\beta_n}\binom{\alpha_{n+1}}{\beta_{n+1}}$ for $\alpha, \beta \in \mathbb{N}_0^{n+1}$
- $C_*\left(\mathbb{R}_+^{n+1}\right)$, The space of continuous functions on $\mathbb{R}_+^{n+1}$, even with respect to last variable
- $C_*^\infty\left(\mathbb{R}_+^{n+1}\right)$, The space of infinitely differentiable function on $\mathbb{R}_+^{n+1}$, even with respect to

last variable

- $S_*\big(\mathbb{R}_+^{n+1}\big)$, The Schwartz space of rapidly decreasing functions on $\mathbb{R}_+^{n+1}$, even with respect to last variable.
- $S'_*\big(\mathbb{R}_+^{n+1}\big)$, the dual of the Schwartz space $S_*\big(\mathbb{R}_+^{n+1}\big)$.