$C_c^\infty(\Omega)$

$\Omega \subseteq \mathbb{R}^n$ DOMAIN

$\{\phi_j\}, \phi \in C_c^\infty(\Omega)$

- $\exists K \subseteq \Omega$ COMPACT ST $\phi_j \equiv 0$ OUTSIDE K $\forall j$
- $\sup\limits_{x \in \Omega} |D^\alpha(\phi_j - \phi)| \to 0$ $(j \to \infty)$ $\forall$ MULTIINDEX α

$\phi_j \to \phi$ $(j \to \infty)$ IN $C_c^\infty(\Omega)$

$u : C_c^\infty(\Omega) \to \mathbb{R}$

- $u(\phi + \psi) = u(\phi) + u(\psi)$ $\forall \phi, \psi \in C_c^\infty(\Omega)$
- $u(c\phi) = cu(\phi)$ $\forall c \in \mathbb{R}, \phi \in C_c^\infty(\Omega)$
- $\phi_j \to \phi$ $(j \to \infty)$ IN $C_c^\infty(\Omega)$ $\Rightarrow u(\phi_j) \to u(\phi)$ IN $\mathbb{R}$

$u \in D'(\Omega)$

$v \in D'(\Omega)$, $c, d \in \mathbb{R}$: $cu + dv \in D'(\Omega)$

α MULTIINDEX: $(D^\alpha u)(\phi) = (-1) u(D^\alpha \phi)$

$\{u_j\} \subseteq D'(\Omega)$ ST $u_j(\phi) \to u(\phi)$ $\forall \phi \in C_c^\infty(\Omega)$: $u_j \to u$ IN $D'(\Omega)$