Consider $V_\epsilon = \{ \phi \in \mathcal{D}(\Omega) : \|\phi\|_N < \epsilon \}$.
$\Rightarrow$ $V_\epsilon \in \tau_K$ since. if we choose l sufficienly large so that $\frac{1}{l} < \epsilon$, and $l > N$, then $V_l = \{ \phi \in \mathcal{D}(\Omega) : \|\phi\|_l < \frac{1}{l} \} \subset V_\epsilon$. $\Rightarrow$ The collection of V_ϵ's forms a subcollection of the local base of τ_K. $\Rightarrow$ We have a smaller topology $\mathcal{J}$ on $\mathcal{D}_K$ than τ_K. $\Rightarrow$ Λ is continuous on this topology $\mathcal{J}$ on $\mathcal{D}_K$. The topology is called C^N-topology on $\mathcal{D}(\Omega)$.

If Λ is such that one N will do for all K, then since Λ is continuous on all $\mathcal{D}_K$. $\Rightarrow$ Λ is continuous on $\mathcal{D}(\Omega)$ $\Rightarrow$ Λ is a distribution in Ω.

Even if Λ is of infinite order, for given compact set $K \subset \Omega$, $\exists$ N_K and C_K s.t $|\Lambda \phi| \leq C_K \|\phi\|_{N_K}$.
$\Rightarrow$ N_K is the order of Λ locally.

6.9 Remark Each $x \in \Omega$ determines a linear functional δ_x on $\mathcal{D}(\Omega)$, by the formula

$$\delta_x(\phi) = \phi(x).$$

Theorem 6.8 shows that δ_x is a distribution, of order 0.

$$\ulcorner \quad |\delta_x(\phi)| = |\phi(x)| \leq \|\phi\|_0 = \max\{ |\phi(x)| : x \in \Omega \} \quad \lrcorner$$

If $x = 0$, the origin of $\mathbb{R}^n$, the functional $\delta = \delta_0$ is frequently called the Dirac measure on $\mathbb{R}^n$.

Since $\mathcal{D}_K$, for $K \subset \Omega$, is the intersection of the null spaces of these δ_x, as x ranges over the complement of K, it follows that each $\mathcal{D}_K$ is a closed subspace of $\mathcal{D}(\Omega)$. [This follows also from Th. 1.27 and part (b) of Theorem 6.5, since each $\mathcal{D}_K$ is complete.].