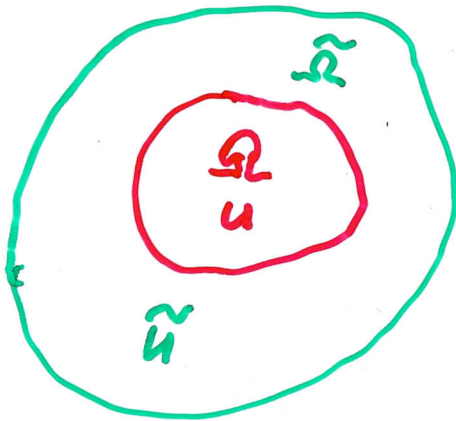


2.6. Extension Theorems

■ Extension Problem:

Let $B = B(\Omega)$ be a B -space of functions over Ω ,
 $\tilde{B} = B(\tilde{\Omega})$ be a B -space of functions over $\tilde{\Omega}$,
 with $\overline{\Omega} \subset \tilde{\Omega} \neq \emptyset$



We look for some rule to construct an extension $\tilde{u} \in B(\tilde{\Omega})$ for some given function $u \in B(\Omega)$ such that

1. $u = \tilde{u}$ on Ω , i.e. $u = \tilde{u}|_{\Omega}$,
2. $\|\tilde{u}\|_{B(\tilde{\Omega})} \leq C_E \|u\|_{B(\Omega)}$
 $\forall u \in B(\Omega), u \rightarrow \tilde{u} = E u$

\tilde{u} is called extension of u under keeping the class B .

■ History:

[1934] H. Whitney: $B = C^k$

[1941] R.M. Hestenes: $B = C^k$

\rightarrow see also Exercise 2.23!

[1953] V.M. Babič: Generalization of the Hestenes extension procedure to $B = W_p^k$

[1961] A.P. Calderon: $B = W_p^k$

via integral representations

⋮

References:

[1981] S.G. Michlin: Konstanten in einigen Ungleichungen der Analysis.
 Teubner-Texte zur Mathematik,
 Leipzig 1981.