

Reminder IX

• For $p \geq 1$, any $f \in L^p(\Omega)$ can be approximated (up to an error of size ε) by a continuous function in $L^p(\Omega)$. Notion of density.

3 steps : 1. bounded function, 2. simple function, 3. continuous function.

• Def of a Hilbert space : complex vector space + scalar product \Rightarrow norm, complete with this norm + countable basis.

• Examples : \mathbb{C}^n , $L^2(\Omega)$, $l^2(\mathbb{N})$, $l^2(\mathbb{Z}^n)$.

• 4 useful inequalities

• strong and weak convergence.