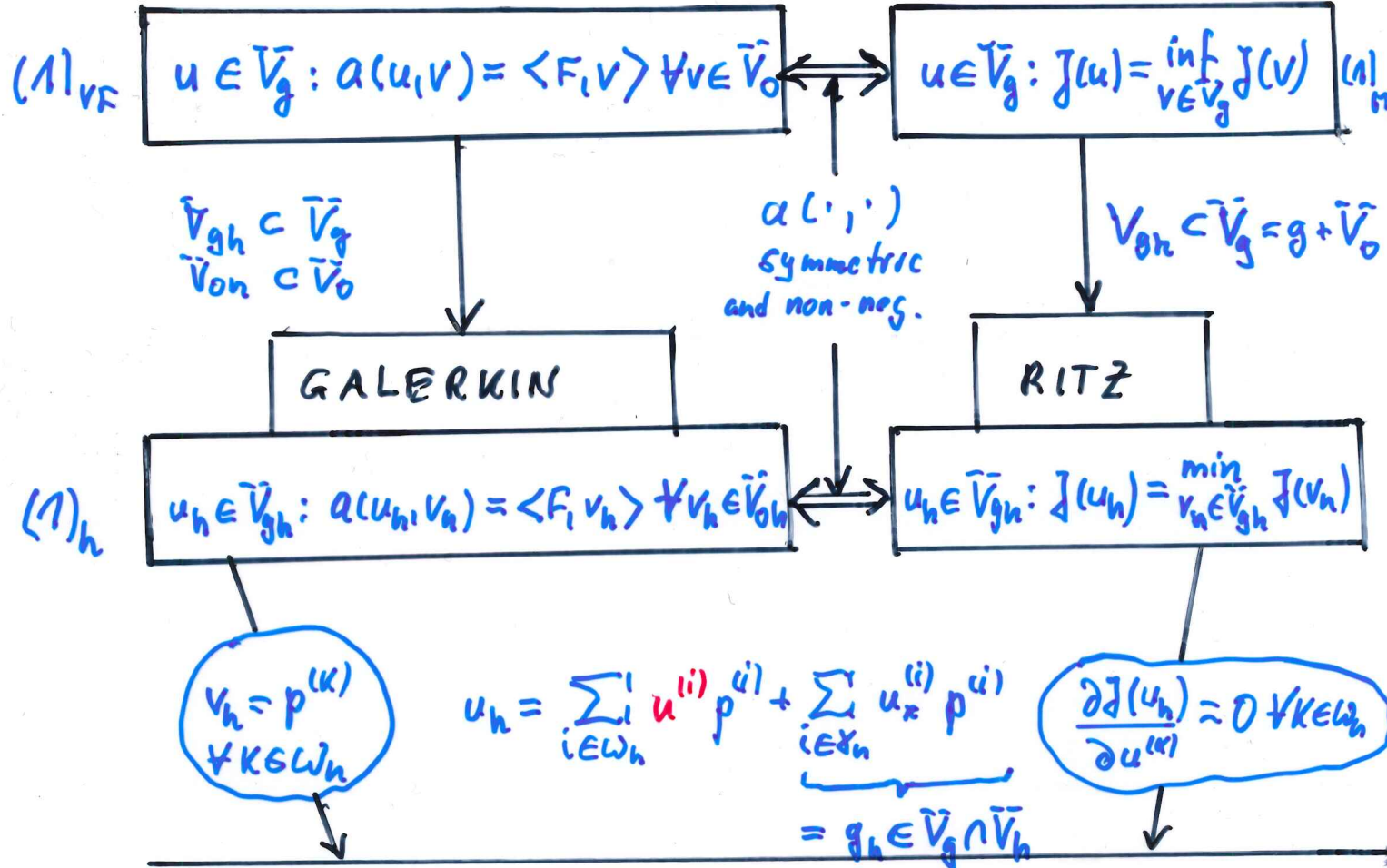


(Primal)

Variational Formulation

Minimization Problem



GALERKIN-RITZ-System = finite-dim. system of algebr. eqns

(2) Find $u_h = [u^{(i)}]_{i \in I_h} \in \mathbb{R}^{N_h} : \sum_{i \in I_h} u^{(i)} a(p^{(i)}, p^{(k)}) = \langle F, p^{(k)} \rangle - \sum_{i \in X_h} u_x^{(i)} a(p^{(i)}, p^{(k)}) \forall k \in I_h$

(3) $(\underline{1})_h \quad K_h u_h = f_h$

ansatz functions with global support

Main Difficulties of Classical GALERKIN-Methods:

- 1 Construction of $V_{0h} \subset \bar{V}_0$ and $\bar{V}_{gh} \subset \bar{V}_g$
- 2 Generation of the GALERKIN-RITZ-system $(\underline{1})_h$
- 3 Solution of $(\underline{1})_h$: Complexity = storage + ops !
- 4 Completeness of the family $\{V_{0h}\}_{h \in \mathbb{N}}$ in \bar{V}_0