

Problem 1

Let V be a vector space and suppose $\{W_i\}$ is a family of subspaces of V .

- (i) Show that $\bigcap_{i \in I} W_i$ is the largest subspace of V contained in every W_i .
- (ii) Show that

$$\sum_{i \in I} W_i := \left\{ \sum_{i \in F} w_i \mid w_i \in W_i, F \subseteq I \text{ finite} \right\}$$

is the smallest subspace containing each W_i .