1 | Axler6.45 orthogonal complement, $U^{\perp}$

if U is a subset of V, then the orthogonal complement of U, denoted $U^{\perp}$, is the set of all vectors in V that are orthogonal to every vector in U:

$$U^{\perp} = \{v \in V : \langle v, u \rangle = 0 \forall u \in U\}$$

1.1 | results

1.1.1 | Axler6.46 basic properties

1. complement is a subspace: if U is a subset of V, then $U^{\perp}$ is a subspace of V
2. $\{0\}^{\perp} = V$
3. $V^{\perp} = \{0\}$
4. If U is a subset of V, then $U \cap U^{\perp} \subseteq \{0\}$
5. If U and W are subsets of V and $U \subseteq W$ then $W^{\perp} \subseteq U^{\perp}$