

$$= (\dim V - \dim U) + (\dim V - \dim W)$$

$$= (\dim V - (\dim U + \dim W - \dim(U \cap W))) \quad (\text{by 2.43})$$

$$= \dim V - \dim(U \cap W) \quad (\text{by solving})$$

$$\textcircled{1} \text{ Thus } \dim V = \dim(U^\circ + W^\circ) + \dim(U \cap W) \quad (\text{rearranging})$$

$$\textcircled{2} \text{ Moreover, observe that } \dim V = \dim(U \cap W)^\circ + \dim(U \cap W) \quad (\text{by 3.10b})$$

$$\text{comparing } \textcircled{1} \text{ \& } \textcircled{2}, \quad \dim(U^\circ + W^\circ) = \dim(U \cap W)^\circ$$

By Exercise 20(1) Axler,

$$U^\circ + W^\circ = (U \cap W)^\circ \quad \#$$