

From the text

Ch. 5: #1, 2, 3, 11; Ch. 12: #5, 6. Please write careful solutions to these problems. (Save the ones marked “difficult” for last.)

Other Exercises

- A. Let K be a field, and let V be a vector subspace of K^n with the usual dot product. Define the *orthogonal complement* V^\perp by

$$V^\perp = \{v \in K^n : v \cdot w = 0 \text{ for all } w \in V\}.$$

Give a simple proof that

$$\dim V + \dim V^\perp = n$$

- B. Show by example that if the characteristic of K is nonzero, then it need not be true that $V \cap V^\perp = \emptyset$.
- C. TBD: (Work with Sage on Posets...)