

Assignment 2

Coverage: 15.2 in Text.

Exercises: 15.2. no 20, 22, 27, 35, 39, 44, 48, 55, 61, 65, 79.

Submit 15.2 no 20, 27, 48, 65, by Jan 27.

Supplementary Problems

1. Let S be a non-empty set in \mathbb{R}^n . Define its characteristic function χ_S to be $\chi_S(\mathbf{x}) = 1$ for $\mathbf{x} \in S$ and $\chi_S(\mathbf{x}) = 0$ otherwise. Prove the following identities:

(a) $\chi_{A \cup B} \leq \chi_A + \chi_B$.

(b) $\chi_{A \cup B} = \chi_A + \chi_B - \chi_{A \cap B}$.

(c) $\chi_{A \cap B} = \chi_A \chi_B$.

This optional problem will be explained in class.