

ECE 341: Probability and Random Processes for Engineers, Spring 2012

Homework 1

Name:

Assigned: 01.11.2012

Due: 01.17.2012

Problem 1. If $A = \{2 \leq x \leq 5\}$ and $B = \{3 \leq x \leq 6\}$, find:

- $A \cup B$
- $A \cap B$
- $(A \cup B) \cap (A \cap B)^c$

Solution 1:

Problem 2. We have two coins: coin A is fair and coin B has two heads. We pick one of the coins at random and toss it twice; heads show both times. Find the probability that the coin picked is fair.

Solution 2:

Problem 3. If $A \subset B$, and $P[A] = 1/4$ and $P[B] = 1/3$, find $P[A|B]$ and $P[B|A]$.

Solution 3:

Problem 4. Draw the probability table (matrix), and the tree diagram describing the following experiment: In a certain village, a random sampling of residents results in females having blue eyes with probability $1/3$, females not having blue eyes with probability $1/4$, males having blue eyes with probability $1/4$ and males not having blue eyes with probability $1/6$. Use the labels F_B, F_{NB}, M_B, M_{NB} .

Solution 4:

Problem 5. If $A \cap B = \emptyset$, show that $P[A] \leq P[B^c]$.

Solution 5: