

## HOMEWORK #1

Due Friday, October 1, 2010 (5:00 p.m.)

**Reading:** Review Chapters 1 and 2

**Problems:**

1. Chapter 1: Problem 1.15
2. Chapter 1: Problem 1.21
3. Chapter 1: Problem 1.38
4. Chapter 2: Problem 2.9
5. Chapter 2: Problem 2.13
6. Let the sample space be  $\Omega = [0, \infty)$ .
  - (a) Let  $\mathcal{F}_1$  be the set of all intervals  $\{[0, a)\}$ . Determine if  $\mathcal{F}_1$  is a field.
  - (b) Let  $\mathcal{F}_2$  be the set of all finite unions of the intervals  $\{[a, b)\}$ . Determine if  $\mathcal{F}_2$  is a  $\sigma$ -field.
  - (c) Show that  $\mathcal{F}_2$  is the smallest field which contains  $\mathcal{F}_1$ .
  - (d) Show that the  $\sigma$ -field generated by  $\mathcal{F}_2$  contains all intervals (closed or open at either end) in  $\Omega$ .