

**Recitation 1**  
**September 4, 2008**

1. Problem 1.5, page 54 of text.

Out of the students in a class, 60% are geniuses, 70% love chocolate, and 40% fall into both categories. Determine the probability that a randomly selected student is neither a genius nor a chocolate lover.

2. Example 1.5, page 13 of text.

Romeo and Juliet have a date at a given time, and each will arrive at the meeting place with a delay between 0 and 1 hour, with all pairs of delays being equally likely. The first to arrive will wait for 15 minutes and will leave if the other has not yet arrived. What is the probability that they will meet?

3. Problem 1.11, page 55 of text (Bonferroni's inequality).

- (a) Prove that for any two events  $A$  and  $B$ , we have

$$\mathbf{P}(A \cap B) \geq \mathbf{P}(A) + \mathbf{P}(B) - 1.$$

- (b) Generalize to the case of  $n$  events  $A_1, A_2, \dots, A_n$ , by showing that

$$\mathbf{P}(A_1 \cap A_2 \cap \dots \cap A_n) \geq \mathbf{P}(A_1) + \mathbf{P}(A_2) + \dots + \mathbf{P}(A_n) - (n - 1).$$