Math 340
Fall 09
Dr. Sethuraman
HW 1
Due Wednesday Sep 9th

1. Problem 7, Page 31, §1.3 of the text.

2. Problem 99, Page 31, §1.3 of the text.

3. An experiment has two possible outcomes. The first occurs with probability p, and the second with probability p^2. What is p? (Hint, apply the axioms of probability functions.)

4. We say that the odds for an event E are $a : b$ if $P(E) = \frac{a}{a+b}$. Suppose that the odds for event E are $3 : 1$ and the odds for event $E \cup F$ are $4 : 1$. Find upper and lower bounds for $P(F)$. (Hint: Relate $P(F)$ to $P(E)$ and $P(E \cup F)$ using inclusion-exclusion. What are upper and lower bounds for $P(E \cap F)$? Use this find the bounds for $P(F)$.)

5. Two cards are randomly selected from an ordinary playing deck. What is the probability that they form a blackjack? (A blackjack is when one of the cards is an ace and the other is either a ten, a jack, a queen, or a king.) State exactly what probability model you are assuming first before answering the question.

6. Two symmetric dice have both had two of their sides painted red, two painted black, one painted yellow, and the other painted white. When this pair of dice is flipped, what is the probability that they both land on the same color? State exactly what probability model you are assuming first before answering the question.

7. Show that the probability that exactly one of the events E or F occurs is $P(E) + P(F) - 2P(EF)$.