Homework 1

Due date: In class, Monday, October 6

1. Reading assignment: Pitman Appendix 1: Counting.

2. Pitman Chapter 1, Section 4 Problems 1.4.8, 1.4.6

3. Pitman Chapter 1, Review Exercises: Problems 4, 10, 12

4. A simplified model for the movement of the price of a stock supposes that on each day the stock's price moves up 1 unit with probability p or it moves down one unit with probability $1 - p$. The changes on different days are assumed to be independent.

   (a) What is the probability that after two days, the stock will be at its original price?

   (b) What is the probability that after 3 days the stock's price will have increased by 1 unit?

   (c) Given that after 3 days the stock's price has increased by 1 unit, what is the probability that it went up on the first day?

5. Suppose that each child born to a couple is equally likely to be a boy or a girl independent of the sex of the other children in the family. For a couple having 5 children, compute the probabilities of the following events:

   (a) All children are of the same sex.

   (b) The 3 eldest are boys, the others girls.

   (c) Exactly 3 are boys.

   (d) The two oldest are girls.

   (e) There is at least one girl.