Assignment #7

Due on Friday February 15, 2008

Read Section 3.1 on *Random Variables and Discrete Distributions*, pp. 97–102, in DeGroot and Schervish.

Do the following problems

1. For each of the following, find the value of the constant c for which the given function, $p(x)$, is the probability mass function (pmf) of some discrete random variable.

   (a) $p(x) = c \left(\dfrac{2}{3} \right)^{x}$, for $x = 1, 2, 3, \ldots$ and zero elsewhere.

   (b) $p(x) = cx$ for $x = 1, 2, 3, 4, 5$, and zero otherwise.

2. Exercise 3 on page 102 in the text

3. Exercise 5 on pages 102 and 103 in the text

4. Exercise 10 on page 103 in the text

5. Select five cards at random and without replacement from an ordinary deck of playing cards. Let X denote the number of hearts in the five cards.

   (a) Find the probability mass function (pmf) of X. Denote it by $p(x)$.

   (b) Determine $\Pr(X \leqslant 1)$.

   (c) Find the cumulative distribution function, $F(x) = \Pr(X \leqslant x)$, and sketch its graph along with that of $p(x)$.