Statistics 394, Problem Set 5

Wellner; 2/2/2000

Reading:	Kelly, Chapter 3, Sections 1.1 - 3.4.
Optional Web Reading:	Section I.C.4 & 5, Distributions & Conditional distributions at http://www.math.uah.edu/stat/dist/index.html .
Due:	Wednesday, February 9, 2000.
Reminder:	Mid-Term Exam: Monday, February 7.

1. K 3.1, # 7 (page 155). (Look at, but don't turn in, # 8.)

2. K 3.2, # 1 (page 167).

3. K 3.2, # 4 (page 167).

4. K 3.2, # 5 (page 167).

5. Suppose that two fair dice are rolled and the sequence of scores (X_1, X_2) are recorded. Let $T = X_1 + X_2$ and $D = X_1 - X_2$ denote the sum and difference of the scores, respectively.
   (a) Find the joint mass function of (T, D); call it $p_{T,D}$.
   (b) Find the marginal probability mass function of D; call it p_D.
   (c) Find the marginal probability mass function of T; call it p_T.
   (d) Are T and D independent? (Justify your answer.)

6. Suppose the same setup as in the previous problem.
   (a) Find the conditional probability mass function of T given $D = d \in \{-5, -4, \ldots, 5\}$.
   (b) Find the conditional probability mass function of D given $T = t \in \{2, 3, \ldots, 12\}$.