CS109A Problem Set #5
Due 4:30 PM, Wednesday 2/22/95

1) (15 points) In the probability space of the deal of two cards, in order, from a 52-card deck, what is the probability that the cards are the same either in rank or in suit? (Exercise 4.9.2(e), FCS)

2) (15 points) In the 6-spot game of Keno (see p. 190 ff., FCS), what is the probability that a player guesses exactly 4 out of 6 correctly?

3) (10 points) Using the space of Fig. 4.14 (p. 190, FCS), give the conditional probability that the first die is even, given that the sum of the dice is at least 10.

4) (15 points) Divide the Chuck-a-Luck (see Example 4.16, p. 182, FCS) probability space into three regions as in Example 4.33 (p. 199). Use this division and Equation (4.10) to compute the probability that there is exactly one 1 showing. (Exercise 4.10.2(c), FCS) *Note*: we shall not cover this formula in class; please read the relevant material, as you should with all assigned sections, even if they are not covered during the lectures or sections.

5) (15 points) Let E and F be two independent events, and let E' and F' be their *complement* events, i.e., the events that E (respectively F) does not occur. (E' is what we referred to as the "compound event" *NOT* E in the notes for 2/10.) Prove that E' is independent of F'. *Hint*: Consider a diagram such as Fig. 4.15 on p. 193, FCS or the diagram on the first page of the notes for 2/10.

6) (15 points) Write a function to return the third element of a list. Define suitable exceptions to tell what is wrong in the cases that the response of the function is not defined. Raise the appropriate exception in response to erroneous inputs. (Exercise 8.2, EMLP).

7) (15 points) Write a function `inverse` that computes $1/x$ for real number x, but handles the `Div` exception that is raised when division by 0 occurs, producing the "large" value 10^{10}. (Exercise 20.4, EMLP).