Name:_____

SID:_____

Section:_____

Midterm Exam #2-Math 032-F '07
Instructor: Devin Greene

The exam is 50 minutes long. No notes are permitted, but calculators are.
Show your work.

Problem #1

Let A={It rains} and let B={It pours}. Transcribe the following statement into normal English:

$$\text{``}A^c \cup B\text{''}$$

Problem #2

A box contains 6 colored blocks of which 2 are cubes, 2 are prisms, and 2 are cylinders. For each of these pairs, one of them is painted white, and the other black. You randomly select a block. Without putting back the block you just chose, you randomly select another block from the remaining five. Which **two** of the following pairs of events are independent pairs?

a) The first block is black. The second block is a prism.
b) The first block is a cylinder. The second block is a cylinder.
c) The first block is white. The second block is white.
d) Both blocks have the same color. The first block is white.

Problem #3

A group of 10 people consists of 5 men and 5 women. A committee of six is chosen at random from the 10. Betty, who is in the group of 10, hopes that she doesn't have to serve in the committee. What is the probability that this will be the case?

Problem #4

You are given three coins and told that two of them are biased and that they both have a 60% chance of coming up heads. The third coin is fair. You do not know which coin is fair. You take one of the three coins at random and flip it three times. It comes up tails for all three flips. What is the probability that it is the fair coin?

Problem #5

You roll a fair die twice. Let D be the difference between the result of the first roll and the result of the second. Find the probability mass function for D, i.e. find P(D=n) for all possible values of n.

Problem #6

A five card hand is drawn from a shuffled 52 card deck. Which one of the following pairs of events is a mutually exclusive pair?

a) There are 4 queens. There are 3 black suits.
b) There are 3 2's and 2 10's. There are 3 hearts.
c) There are exactly 3 cards of the same suit. There are 3 jacks.
d) No two cards have the same rank. All cards belong to the same suit.