1) An experiment consists of drawing 3 coins (all at once) from a purse that contains 3 pennies (dated 2001, 2002, and 2003), 2 nickels (dated 2004 and 2005) and a quarter (dated 2006).
a) [5] Describe the sample space

List the outcomes in the following events:
b) [5] getting more than 30 cents

c) [5] getting all three kinds of coin

2) Event A contains 100 different outcomes <u>of which</u> 30 are in event B and 40 are in event C. There are 10 outcomes in the intersection of all three events.
a) [5] How many outcomes are in A but in neither B nor C?

b) [5] If in addition to the above, B and C have 20 outcomes
in common (both in and out of A), and C contains 70 outcomes
that are neither in A nor B, how many outcomes are in C?

3) [10] Find the probability of having at least one face card in a 5-card hand of poker. Provide an explanation for your work. (Hint.There are 12 face cards. There are 2,598,960 possible 5-card hands. How many have no face cards?)

4) Dusty drank beer in **five** bars Friday night with his friends, leaving **four** $10-bills behind as tips. But he wasn't paying attention, and all the ways of distributing the bills among the bars can be assumed to have been equally likely.

a) [10] What's the probability that he left all four in one bar? (Provide an explanation for your work.)

b) [5] What's the probability that he left no more than one in each bar? (Provide an explanation for your work.)

5) [10] Find the number of distinguishable permutations of the letters in "TENNESSEE TITANS". (Ignore the space).

6) [10] What is the probability of getting a "four-flush" (*i.e.*, exactly four cards of the same suite) in a 5-card poker hand?

7) [15] There are 5 white and 5 black balls in a box. Two are removed and replaced by black balls, then 5 are selected. What is the probability that all the selected balls are white?

8) [15] 65% of the people in Dogpatch County are infected with cat scratch fever. 85% of those with cat scratch fever have a runny nose, and 23% of those without cat scratch fever have a runny nose. What's the probability that someone with a runny nose has cat scratch fever?