HOMEWORK 10 - MATH 111

DUE DATE: Friday, December 12
INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. In a U.S. state, 40% of the population lives in inner cities, 35% in suburbs and 25% in rural areas. 30% of those living in inner cities receive poor medical care and the corresponding probabilities for those living in the suburbs and in rural areas are 10% and 20%, respectively. Find the probability that a person in the population selected at random receives poor medical care.

2. In the country Utopia, the official language is Utopic, whose alphabet has only 17 letters, and the numbering system provides only for 8 digits, 4 good and 4 bad. In that country, the licence plates of registered vehicles consist of two triples: the first triple consists of two letters followed by a number and the second pair consists of two numbers followed by a letter.

   (a) How many Utopic licence plates are possible?
   (b) How many are possible if the beginning number of the second pair is not allowed to be bad?

3. How many different "words" may formed by using all the letters in the word "TALLAHASSEE"? (Look at a similar problem in your book!)

4. The U.S. senate has 55 republican and 45 democratic senators. A committee of 20 members is to be formed consisting of 12 republicans and 8 democratic senators. In how many ways is it possible to form such a committee?

5. A bridge hand consists of 13 cards out of a normal deck of 52 cards. Find the probability that a bridge hand contains

   (a) 3 face cards and 2 aces.
   (b) 7 cards of one suit and 6 of another.

6. Suppose that a secret Iraqi War Council has a board consisting of 12 American, 4 British, 2 Spanish, 1 Italian and 1 Polish member. A committee of 5 members of this board is to be formed to deal with issues concerning coalition forces. In how many ways can such a committee be formed so that at least three of the non-American members are members of the committee?

7. A coin is tossed 7 times. What is the probability of obtaining at most 2 heads? What is the probability of no less than 6 tails?

8. A certain machine produces a defective item with probability 0.05. What is the probability that out of 100 items manufactured by this machine at least one non-defective item is produced?