HOMEWORK 10 - MATH 111

DUE DATE: Friday, April 25
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, 20% of the population lives in inner cities, 35% in suburbs and 45% in rural areas. 20% 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 5% and 10%, respectively. Find the probability that a person in the population selected at random receives satisfactory care.

2. In the country Utopia, the official language is Utopic, whose alphabet has only 16 letters, and the numbering system provides only for 7 digits. In that country, the licence plates of registered vehicles consist of two pairs: the first pair consists of a letter followed by a number and the second pair consists of a number 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 that one number of the seven that represents 0?

3. How many different "words" may formed by using all the letters in the word "TENNESSEE"?

4. The U.S. senate has 53 republican and 47 democratic senators. A committee of 11 members is to be formed consisting of 7 republicans and 4 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) 5 face cards.
   (b) 5 cards of one suit and 8 of another.

6. Suppose that a government agency has a board consisting of 8 Caucasian, 3 Hispanic and 4 African American members. A committee of 5 members of this board is to be formed to deal with issues concerning Hispanics. In how many ways can such a committee be formed so that at least one of the Hispanic board members is also a member of the committee?

7. A coin is tossed 7 times. What is the probability of obtaining at least 5 heads? What is the probability of no more than 2 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 defective item is produced?