Stat 113 (Introduction to Mathematical Statistics)

Problem Set No. 2

INSTRUCTIONS: Answer the following as indicated. Provide a neat and detailed solution.

1. A student is allowed to pass a test on three tries. The probability that the student passes the test on the first attempt is 0.5, that he passes on the second attempt (of course, given that he failed on the first attempt) is 0.7, and the probability that he passes on the third attempt is 0.8 (given he failed on the first two attempts). What is the probability that he will pass the test?

2. Suppose we roll two dice. If it is known that at least one of the dice shows 4, find the probability that the numbers appearing on the dice have a sum of 8.

3. Suppose 36% of families own a dog, 30% of families own a cat, and 22% of the families that have a dog also have a cat. A family is chosen at random and found to have a cat. What is the probability they also own a dog?

4. The work force of a large company has the following distribution according to the nature of their work and their sex.

	Type of worker			
Sex	**Sales**	**Clerical**	**Production**	**Total**
Male	825	675	750	2,250
Female	1,675	825	250	2,750
Total	2,500	1,500	1,000	5,000

   a. What is the probability of a randomly selected male worker is in sales?

   b. What is the probability that a randomly selected worker is a female if she is involved in production?

   c. What is the probability that a randomly selected worker is in the clerical department given that he is a male?