Stat 113 (Introduction to Mathematical Statistics)

Problem Set No. 1

1. A retailer sells only two styles of stereo consoles, and experience shows that these are in equal demand. Four customers in succession come into the store to order stereos. The retailer is interested in their preferences.

    a. List the possibilities for preference arrangements among the four customers (that is, list the sample space).
    b. Assign probabilities to the sample points.
    c. Let A denote the event that all four customers prefer the same style. Find $P(A)$.

2. The probability that a customer at a bank will cash a check is 0.72, the probability that he will ask to have access to his safety deposit box is 0.09, and the probability that he will do both is 0.003. What is the probability that a customer at this bank will

    a. either cash a check or ask to have access to his safety deposit box?
    b. do neither?
    c. encash a check only?

3. An examination is designed where the students are required to answer any 20 questions from a group of 25 questions. How many ways can a student choose the 20 questions?

4. A student prepares for an exam by studying a list of ten problems. She can solve six of them. For the exam, the instructor selects five problems at random from the ten on the list given to the students. What is the probability that the student can solve all five problems on the exam?

5. A local fraternity is conducting a raffle where 50 tickets are to be sold—one per customer. There are three prizes to be awarded. If the four organizers of the raffle each buy one ticket, what is the probability that the four organizers win

    a. all of the prizes?
    b. exactly two of the prizes?
    c. exactly one of the prizes?
    d. none of the prizes?