1) Let $A = \{2, 5, 8, z, \$\}$, $B = \{5, \uparrow, z, 8, p\}$, and $C = \{2, z, 9, p, \Delta\}$. Find the following:

   a) $A \cup (B \cap C)$

   b) $(A \cup B) \cap C$

   c) $A \cap (B \cup C)$

   d) $A \cap (B \cap C)$

   e) Find $n(A \times B)$

2) During a midnight showing of "Gone With the Wind", Tom noticed that there were 46 other people in the theater. He also noticed that all of these other people were either sleeping or wearing hats (or both). He counted 31 people sleeping and 24 wearing hats. How many people who were sleeping were also wearing hats?

3) The local diner offers a meal combination consisting of an appetizer, a soup, a main course, and a dessert. There are four appetizers, two soups, four main courses, and four desserts. Your diet restricts you to choosing between a dessert and an appetizer. (You cannot have both.) Given this restriction, how many three-course meals are possible?

4) A test has 12 true-false questions, then a choice of either completing 6 multiple choice questions with 1 correct answer out of 4, or completing 5 multiple choice questions with 1 correct answer out of 3. How many different completed answer sheets are there?

5) Professor Easy's final examination has 9 true-false questions followed by 3 multiple-choice questions. In each of the multiple-choice questions, you must select the correct answer from a list of six. How many answer sheets are possible?

6) The following table shows the results of a survey of 200 authors by a publishing company.

	New Authors	Established Authors	Total
Successful	16	44	60
Unsuccessful	38	102	140
Total	54	146	200

Compute the relative frequency of the following events.

a) An author is successful and new.

b) An author is a new author.

c) A successful author is established.

d) An established author is successful.

e) An unsuccessful author is new

7) Suzan has a bag containing four red marbles, three green ones, two white ones, and one purple one. She grabs five of them. Find the probability of the following events, expressing each as a fraction in lowest terms.

a) She has none of the red ones.

b) She has at least one white one.

c) She has at most one green one.

d) She has two green ones and one of each of the other colors.

e) She has all the red ones.

8) You toss a nickel, a dime, and a quarter once each.

a) Find the number of elements of the sample space S for this experiment, that is, find $n(S)$.

b) Let E be the event that at most one of the coins comes up tails, and let F be the event that the quarter comes up heads. (Note: "P(E) = probability of the event E")

Find the following:

i) $n(E)$

ii) $n(F)$

iii) $n(E \cap F)$

iv) $P(E)$

v) $P(F)$

vi) $P(E \cap F)$

9) Compute the indicated quantities:

    a) $P(A|B) = .1, P(B) = .4$. Find $P(A \cap B)$

    b) $P(A|B) = .7, P(B) = .4$. Find $P(A)$,(Assume A and B are independent)

    c) $P(A) = .7, P(B) = .2$. A and B are independent. Find $P(A \cap B)$