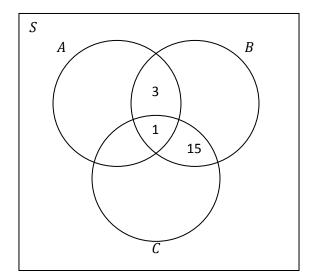1) Let $A = \{2, 5, 8, z, \$\}, B = \{5, \uparrow, z, 8, p\}$, and $C = \{2, z, 9, p, \Delta\}$. Find the following:

   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) Find the cardinality of the following sets.
   a) The set of all outcomes of rolling **two distinguishable** dice such that the numbers add to 8
   b) The set of all outcomes of tossing **three indistinguishable** coins.

4) Use the given information to complete the solution of the partially solved Venn Diagram.

$$n(A) = 30, n(B) = 25, n(C) = 33,$$
$$n(A \cap C) = 10, n(S) = 60$$

5) A test requires that you answer first Part A and then either Part B or Part C. Part A consists of seven true-false questions, Part B consists of three multiple-choice questions with one correct answer out of five, and Part C consists of three questions with one correct answer out of four. How many different completed 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 $P(A \cap B)$

In addition to these problems, you should also look again at the homework problems and the