Probability Review

1. A family has three children. Using b to stand for boy and g to stand for girl, and using ordered triples such as bbg, find the following.

    a. draw a tree diagram to determine the sample space
    b. write the event *E* that the family has exactly two boys
    c. write the event *F* that the family has at least two boys
    d. write the event *G* that the family has three boys
    e. *p(E)*
    f. *p(F)*
    g. *p(G)*
    h the probability that there are exactly two boys given that the first child is a girl.

2. Mendel found that snapdragons have no color dominance; a snapdragon with one red gene and one white gene will have pink flowers. If a pure red snapdragon is crossed with a pink snapdragon, find the following probabilities.

    a. a red offspring
    b. a white offspring
    c. a pink offspring

3. If a single card is drawn from a deck of 52 cards, find each of the following probabilities:

    a. a black card
    b. a heart
    c. a queen
    d. a card below a 5 (count an ace as high)
    e. a card above a 9 (count an ace as high)
    f. a card below a 5 **and** above a 9 (count an ace as high)
    g. a card is below a 5 **or** above a 9 (count an ace as high)

4. Alex is taking two courses, algebra and U.S. history. Student records indicate that the probability of passing algebra is 0.25; that of failing U.S. history is 0.45; and that of passing at least one of the two courses is 0.80. Find the probability of each of the following.

   a. Alex will pass history.
   b. Alex will pass both courses.
   c. Alex will fail both courses.
   d. Alex will pass exactly one course.

5. On the basis of his previous experience, the public librarian at Smallville knows that the number of books checked out by a person visiting the library has the following probabilities

Number of Books	0	1	2	3	4	5
Probability	0.05	0.15	0.25	0.35	0.05	0.15

   Find the expected number of books checked out by a person visiting this library.

6. A group of 600 people were surveyed about violence on television. Of those women surveyed, 256 said there was too much violence, 45 said that there was not too much violence, and 19 said they don't know. Of those men surveyed, 162 said there was too much violence, 95 said that there was not too much violence, and 23 said they don't know.

   a. What is the probability that a person surveyed was a woman and thought there was not too much violence on television?
   b. What is the probability that a person thought there was too much violence on television given that the person was a woman?
   c. What is the probability that a person who was a man thought that there was not too much violence on television?