Extra Counting Practice

1. A fair coin is tossed 10 times. (i) Find the probability of getting exactly three heads. (ii) Find the probability of getting 3 or fewer heads.

2. A class consists of 15 boys and 30 girls. Ten students are selected at random for a special committee. Find the probability that exactly three boys are selected.

3. We will deal all the cards of a standard deck (52 cards) to 4 players (so each get 13 cards). Find the probability that each player gets (exactly) one ace.

4. A box has 24 light bulbs, where exactly 2 are defective. If you select 10 bulbs (without replacement) what is the probability that both bad bulbs will be selected?

5. A boy has 5 blue and 4 white marbles in his left pocket, and 4 blue, 5 white marbles in his right pocket. If he transfers one marble from his left pocket to his right, what is the probability of his then drawing a blue marble from his right pocket?

6. In a small pond, there are 50 fish where 10 of them have been tagged. A fisherman selects seven fish at random and without replacement. Find the probability that 2 of the tagged fish have been caught.

7. From a 1995 study of the wreck of the *Titanic*, it was found that, of the adults on board:

	Male	Female
Survived	338	316
Died	1329	109

   (NOTE: It is most helpful if you think about how to convert each question into a mathematical statement before computing the answers)

   (a) What was the probability of dying, given that you were female (assume only adults)?
   (b) What was the probability of being an adult male on the *Titanic* on the day she went down?
   (c) What was the probability of dying on the *Titanic* (from the adult data)?
   (d) Would the number $\dfrac{1329}{1329 + 109}$ be meaningful? Is this being male and dying? If not, what is that probability?

8. Does a monkey have a better chance of rearranging

   $$A\ C\ C\ L\ L\ U\ U\ S \text{ to spell } CALCULUS \text{ or } A\ A\ B\ E\ G\ L\ R \text{ to spell } ALGEBRA$$

9. Nine cards are dealt from a standard 52-card deck. Write a formula for the probability that three of the five even numerical denominations (those are 2, 4, 6, 8, 10) are represented twice, one of the three face cards (those are Jack, Queen, King) appears twice, and a second face card appears once. HINT: It's important to piece this one out.

10. Doug is not the world's greatest poker player. Dealt a two of diamonds, an 8 of diamonds, an ace of hearts, an ace of clubs and an ace of spades, he discards the three aces. What are the chances of drawing to a flush? You may assume that Doug is the only one getting cards from that deck. (A flush is where the cards are all of the same suit, but not necessarily in numerical order).