1. You are being dealt five cards from a standard deck of 52 playing cards. Find the probability that you are dealt two clubs and three red cards.

2. A dartboard has a radius of 9 in. and is composed of a bull’s eye with a radius of 1 in. surrounded by four concentric rings, each has a width of 2 in. If you randomly throw a dart at the board (and hit it), find the probability of hitting each individual ring as well as the bull’s eye. (*Hint: Picture?*)

3. A plane has crashed in one of three equally likely, different regions. Region 1 is a wooded area, region 2 is a relatively flat farming area, and region 3 is a hilly area. Searchers choose to start looking in region 2 because is it the easiest to search and they believe that if a plane has crashed in this region, the probability that they find it is 0.9. If they search region 2 and do not locate the plane, find the conditional probability that the plane is in region 3. (*Hint: You need a compliment*)

4. Suppose that there are three corporations competing for four different government contracts. If the contracts are awarded randomly, what is the probability that each corporation will get a contract?

5. The registrar reported that among 1300 students, 700 students did not register for either a math or English course, 400 registered for an English course, and 300 registered for both types of courses. a) How many registered for an English course but not a Math course? b) How many registered for a math course?

6. Find the indicated sets with:

$$U=\left\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\right\}, A=\left\{1, 2, 3, 4, 5, 6,\right\}, B=\left\{4, 5, 6, 7, 8\right\}, C=\left\{5, 6, 7, 8, 9, 10\right\}$$

a) $A\bigcap\_{}^{}B\bigcap\_{}^{}C$ b) $A\bigcap\_{}^{}(B^{c}\bigcup\_{}^{}C)$

c) $(A\bigcup\_{}^{}B\bigcup\_{}^{}C)^{c}$ d) $A^{c}\bigcap\_{}^{}B^{c}\bigcap\_{}^{}C$

e) $A\bigcup\_{}^{}(B\bigcap\_{}^{}C)$

7. Callahan Auto Parts has hired 12 new employees, and must assign 8 to the day shift and 4 to the night shift. Assume that the 12 employees consist of 6 men and 6 women and that the assignments to day and night shift are made at random. (a) What is the probability that all 4 of the night-shift employees are men?(b) What is the probability that at least one of the night-shift employees is a woman?

8. A small island has three bridges connecting it to the main land. In the next year, bridge A has a 15% chance of collapsing, bridge B has a 5% chance of collapsing, and bridge C has a 20% chance of collapsing. What is the probability that exactly one bridge will collapse next year?