Name:

Instructions:

- All answers must be written clearly.

- You may use a calculator, but you must show all your work in order to receive credit.

- Be sure to erase or cross out any work that you do not want graded.

- If you need extra space, you may use the back sides of the exam pages (if you do, please write me a note so that I know where to look).

- You must include all work to receive full credit.

- **This sample exam is simply to give you an idea of the type of questions that can be asked. It is not enough to use only this sample exam to study for the actual exam. You must go back and study the properties of Probability and re do all the HW problems to guarantee yourself a good grade!**

Question:	1	2	3	4	5	6	Total
Points:	0	0	0	0	0	0	0
Score:							

1. A certain state has license plates showing three numbers (0 through 9) and three letters (A through Z). How many different license plates are possible:

    (a) If the numbers must come before the letters?

    (b) If there is no restriction on where the letters and numbers appear?

2. Consider a standard deck of 52 cards.

    (a) A gin hand consists of 10 cards from a standard deck of 52 cards. Find the probability that a gin hand has all 10 cards of the same suit.

    (b) Find the probability that a gin hand has a three pair. (e.g. $aabbccdefg$)

3. An urn contains 6 red, 4 blue, 8 green and 2 yellow balls. If a set of 4 balls is randomly selected (no replacement), what is the probability that each of the balls will be

    (a) The same color?

    (b) Of different colors?

4. Independent flips of a coin that lands on heads with probability p are made. What is the probability that

   (a) the first 10 outcomes are tails?

   (b) the first 3 outcomes are heads?

   (c) there are at least 1 heads in the first 10 outcomes?

5. A local college student goes to a bar 7 nights a week: 3 of the nights at bar A, 2 of the nights at bar B, and 2 of the nights at bar C. He'll get a girl's number 99 percent of the time at bar A, 96 percent of the time at bar B , and only 85 percent of the time at bar C.

(a) On a random night of the week, what is the probability that he gets a girl's number?

(b) Given that he doesn't get a girl's number, what is the probability that it was at bar C?

6. Show that if $\mathbb{P}(A) > 0$, then

$$\mathbb{P}\left(A \cap B \mid A\right) \geq \mathbb{P}\left(A \cap B \mid A \cup B\right).$$