Names:

## CMPSCI 240 Reasoning Under Uncertainty Discussion 2

Use your knowledge of counting to answer the following questions. Show all of your work.

1. In poker, a *straight* is a hand consisting of five cards of sequential rank. The suits do not matter. An example of a straight would be 4-5-6-7-8. In a straight, an ace can serve as a "high" card, as in 10-J-Q-K-A, or as a "low" card, as in A-2-3-4-5. Imagine you choose five cards at random from a 52-card deck. How many ways can you obtain a straight?

2. A *flush* is a hand consisting of five cards all of the same suit. The ranks do not matter. An example of a flush would be 2♡-4♡-7♡-8♡-K♡. Imagine you choose five cards at random from a 52-card deck. How many different ways are there to obtain a flush?

3. A *full house* is a hand consisting of three cards of one rank and two cards of a different rank. An example would be 2♡-2◊-2♠-9◊-9♡. Imagine you choose five cards at random from a 52-card deck. How many different ways can you obtain a full house are there?

4. You select five cards at random from a 52-card deck, but don't look at them immediately. You look at the first two cards and see that they match in rank (i.e., you have a pair). Given this information, what is the conditional probability that your entire hand is a two-pair hand?

5. You select five cards at random from a 52-card deck, but don't look at them immediately. You look at the first two cards and see that they match in rank (i.e. you have a pair). Given this information, what is the conditional probability that your entire hand is a full house?