

5 Nov 2014

Math 181

Permutations and Combinations:

1. Should I use permutations or combinations to determine the probability of a particular poker hand?
2. Should I use permutations or combinations to determine how many “combinations” are possible for a lock on a safe?
3. Pizza Place offers the choice of white or wheat crust. They also offer the following toppings: cheese, pepperoni, ham, mushrooms, sausage, and onions. How many different types of pizza can they claim to offer?
4. Two students are arguing during a game of poker over whether a flush (5 cards of the same suit) beats a straight (5 sequential cards). The rarer hand should be the winner. If they are using a standard deck of 52 cards, how can you determine which hand is better?

Playing Cards: Consider the following game.

Each player is dealt two cards from a standard 52-card deck. A pair beats a hand with non-matching cards, and a pair of aces is the highest hand. When there is no pair, the highest card is used to determine the winner. If two players have the same highest card, consider the second-highest card. It is still possible that there is a tie, for example if two players have a 7 and a 5, but of different suits.

1. How many possible hands are there?
2. How many ways can you get a pair?
3. How many ways can you have a 3-high hand?
4. How many ways can you have an A-high hand?
5. Deal two cards face-up for the group. How many hands does this hand win against? (Note: it may be easier to determine how many it loses against and subtract from #1.)
6. Suppose you are dealt King and a Queen. Would you expect this to be a winning hand if you are playing against the rest of your group? What about if everyone in the class is also playing?
7. Does the answer to #6 change based on whether everyone is dealt from the same deck or if each person is dealt from a different deck?

Homework: Read the introduction to Chapter 9 along with sections 9.1 and 9.2.

Respond to the emails about individual projects. My email suggests projects based on feedback you gave me earlier, but I’m open to any having the project be about something not on my list of suggestions.