UW Math Circle

October 22, 2015

Homework

1. How many ways are there to pick 6 cards from a deck of 52 cards so that there is at least 1 card from each of the 4 suits?

2. (a) A bus has 50 passengers and makes 10 stops. How many ways are there for people to get off the bus (after the 10^{th} stop, everyone must be off the bus)

   (b) How many ways are there for the passengers to get off the bus if you only care about the number of passengers that get off at each stop?

3. You flip a coin 10 times. How many ways are there to do this so that you never get 2 heads in a row?

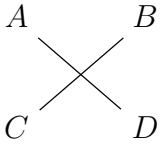
4. There are 16 people seated at a round table. How many ways are there for everyone to shake hand with one other person, so that no one's arms cross anyone else's?

   For example, if there were 4 people seated in the following way

   A B

   C D

   there are 2 possibilities: A—B / C—D and A B / | | / C D.

   The formation 

   is not allowed because A and D have their arms crossing with B and C.