Quiz 1

1. Ivan (I), Jeff (J), and Katrin (K) try to complete a homework problem set. Suppose I succeeds with probability $1/2$, J succeeds with probability $1/3$, K succeeds with probability $1/4$, neither I nor J succeed with probability $1/4$, neither I nor K succeed with probability $1/3$, neither J nor K succeed with probability $1/2$, and all succeed with probability $1/24$. Given that exactly one person succeeds, what is the probability that it is J?

2. Following *deuce* in a tennis game, the player winning 2 more points than his/her opponent wins this game. Alex and Bob play a tennis game which reaches deuce. What is the probability that Alex wins the game if he wins each point with probability $2/3$?

3. 3 persons take a tour bus with 4 passenger seats. Suppose seating is assigned randomly for the trip to destination and the trip back. What is the probability that at least one person takes the same seat in both trips?

4. A small pack of nuts includes 7 to 11 nuts, consisting of (0 or more) peanuts, hazelnuts, almonds, pistachios, and cashews. How many different compositions are there for such a small pack?

5. Alex, who is married, has been murdered. Suppose 1% of the murders of married people are committed by spouse. The blood type of the suspect's blood at the scene, which 20% population have, matches his wife's. Given this evidence, what is the probability that his wife is guilty?