Quiz 1 2017.03.28

1. You are told that $100 is equally likely to be in any one of 3 closed envelops. You first pick one envelop. The host opens for you one of the remaining envelops, after making sure that the money is not in it. At this point, you can stick with the original choice, or switch to the other unopened envelop. Would you pay $50 to play this game? Why?

2. Romeo and Juliet have a date, and each will show up with a delay between 0 and 1 hour, with all delays being equally likely. Romeo would wait for no more than 20 minutes, while Juliet would wait for no more than 10 minutes. What is the probability that they will meet?

3. Use random experiments on coin flips to provide an example for

   - (5%) finite sample space
   - (5%) countably infinite sample space
   - (10%) uncountable sample space

4. The test result for a certain rare disease is correct 95% of the time. Any person has a probability of 0.001 of having the disease. Given that John Doe tests positive **twice**, what is the probability that he actually has the disease?

5. You roll a fair 6-sided die. If the result is 1 or 2, you roll once more, otherwise you stop. What is the probability that the sum of your rolls is at least 6?