STAT/MA 41600

In-Class Problem Set #2: August 26, 2016

1. Consider a collection of 3 dice. One die is red, one die is green, and one die is blue. Each die is 6-sided and is numbered from 1 to 6. Roll each of the 3 dice (1 time each).
1a. What is the probability that the 3 dice have distinct values?
1b. What is the probability of the event that $R < G < B$?
1c. What is the probability of the event that $G < R < B$?
1d. What is the probability that $R = G < B$?

2. Consider a standard deck of 52 cards. Deal 5 cards in a row, left to right, on the table. So an outcome is an ordered 5-tuple of cards.
2a. What is the probability that the leftmost card is a Jack?
2b. What is the probability that the rightmost card is a Jack?
2c. What is the probability that there is at least one Jack, among the middle three cards on the table, i.e., among the 2nd, 3rd, and 4th cards?
2d. Does your answer to today's **2c** agree with your work from Problem Set 1? I.e., if you return to Problem Set 1 to consider the quotient of **2d** and **2a**, does your answer agree?

3. Consider 5 consecutive tosses of a coin.
3a. What is the probability that a head occurs on the last flip (the other 4 can be arbitrary)?
3b. On Problem Set 1, were all of the 32 outcomes in part **3a** equally likely? So, does your answer to today's question **3a** agree with your reasoning from **3a** and **3c** on Problem Set 1?
3c. What is the probability of the event that at least 2 heads appear at the start, and the last flip is a tail?

4. Consider a collection of 3 dice (standard 6-sided dice). Roll each of the 3 dice (1 time each). These dice are *not* red, green, blue. They are all white.

4a. What is the probability that the 3 dice have distinct values?

4b. What is the probability that there is agreement among exactly two of the dice (i.e., a pair appears), and the remaining (non-matching die) is the largest of all?