Math 477, Homework 4

Name: _____

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1. Suppose we have two coins, coin A and coin B, and flip them each 10 times. Let E be the event that every time coin A comes up heads, so does coin B. Find $P(E)$.

   hint: use conditional probability

2. Suppose we have 3 baskets, the first containing 6 white and 4 blue balls, the second containing 1 white and 9 blue balls, and the third containing 3 white and 7 blue balls. If a ball is selected from one of the baskets, (each of the balls being equally likely), and the ball is white, what is the probability that it came from the second basket?

3. Show that if $P(A) > 0$ then $P(AB|A) \geq P(AB|A \cup B)$.

4. Suppose we have 10 people, 5 on team A and 5 on team B. After a competition, they are ranked from 1 to 10. Let X be the best ranking obtained by a member of team A (i.e. if a person from team A wins, then $X = 1$). Find $P(X = i)$ for $i = 1, \ldots, 10$.