

1. The World Series in Major League Baseball is a best-of-seven series; in other words, the American League Team (A) and National League Team (N) play until one team has won four games. We can list the result of the series using a sequence of A's and N's, where "AAANA" would mean the American League Team won the first, second, third, and fifth games to win the series. How many different results are possible if the series goes (a) four games? (b) five games? (c) six games? (d) seven games?
2. My wife and I currently have a single child, a son. If we were to have four children total, what is the probability that we would have exactly two sons and two daughters? (Be careful here, and explain your reasoning!)
3. Two cards are drawn from a deck, one after the other, and without replacement. Compute the probability of drawing (a) a pair of aces (b) two hearts (c) a heart on the first draw, a club on the second, and (d) a heart on the first draw, and an ace on the second (Note that the heart on the first draw could be the ace of hearts!)
4. I am taking a 10-question True/False quiz and I simply have no clue what the right answers are. I have to guess on every single problem. (You may assume that the probability of any one single guess being correct is 0.5.) What is the probability that I get exactly four questions correct?