

1. Urn A contains 7 red balls and 3 green balls. Urn B contains 4 red balls and 6 green balls. An experiment is conducted as follows:
Roll a pair of dice. If the sum is 5 draw three balls from Urn A without replacement. Otherwise, draw three balls from Urn B without replacement.
 - a) What is the probability that exactly two of the balls are red?
 - b) What is the conditional probability you drew from Urn A given that exactly two of the balls were red?
2. A bomber pilot (Catch 22) has to make one bombing run per week until he gets shot down. On each bombing run he has a probability of .95 of not being shot down.
 - a) What is the probability he makes at least four bombing runs?
 - b) How many runs can he expect to make?
 - c) What is the variance for the number of bombing runs he'll make?
3. What is the probability of getting a full house in seven card poker, i.e., no more than three of any kind, three of at least one kind, and at least two of another kind.
4. There are 9 men and 11 women in a group. 7 are chosen at random.
 - a) What is the probability you get more women than men?
 - b) How many women do you expect there to be?
 - c) What is the variance for this question?
5. There are 300 misprints in a 100 page document. Suppose the number of misprints on a given page follows a Poisson distribution. What is the probability there at least two misprints on page 57?
6. Joe repeatedly plays a game where he has a $1/3$ chance of winning each time. Suppose he plays it 5 times.
 - a) What is the probability he loses more often than he wins?
 - b) What is the expected number of wins?
 - c) What is the variance for the number of wins?