

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:

Flip 3 coins. If you get exactly two heads, draw **with** replacement from Urn A until you get a red ball. Otherwise, draw **with** replacement from urn B until you get a red ball.

  - a) What is the probability the first red ball comes on the fourth draw?
  - b) What is the conditional probability you drew from Urn B given that the first red ball comes on the fourth draw?
2. Roll a pair of dice. If the sum is less than 5 you win. Play this game six times.
  - a) What is the probability you lose more often than you win?
  - b) What is the expected number of wins?
  - c) What is the variance for the number of wins?
3. Deal a 7 card hand.
  - a) What is probability you get less than 3 aces?
  - b) How many aces do you expect there to be?
  - c) What is the variance for this question?
4. Roll a die until you've gotten three sixes.
  - a) What is the probability you finish on the 7th roll?
  - b) How many rolls do you expect to make?
  - c) What is the variance for the number of rolls?
5. Deal 10 cards. What is the probability you get four of one kind and at least three of another kind?
6. A particular locality experiences a major earthquake on an average of once every 3 years. Suppose the occurrences of major earthquakes in that locality follow a Poisson distribution.
  - a) What is the probability they have two major quakes in 2015?
  - b) What is the probability they have more than one major quake in 2015?