

COUNTING TECHNIQUES

1. A bag contains six white balls and four red balls. You take out three balls at the same time.
 - a) What is the probability that exactly two of the balls will be red?
 - b) What is the probability that all three will be red?
 - c) What is the probability that at least one ball of the three will be red?

2. A bag contains five white balls, three green balls and eight red balls. You take out two balls at the same time.
 - a) What is the probability that the two will be green?
 - b) What is the probability that the two will be red?

3. A manufacturer of microwave ovens wishes to separate defective microwaves from acceptable ones. Through an error, a shipment of nine is sent out containing two defective microwaves and seven acceptable ones. A customer buys two of these without testing them
 - a) What is the probability that the two will be acceptable?
 - b) What is the probability that one will be defective and one acceptable?

4. Three cards are selected at random from a set of seven cards. Two of the cards are marked with the words “you win” and five with the words “try again”
 - a) FTPT exactly one of the cards is a winning card
 - b) FTPT no card is a winning card

5. Your name, along with nine others, is put in a hat. Four names are drawn at random to determine the winners of four identical prizes. FTPT your name will appear.

6. Your brother is saving labels from soup cans. He removes labels from three cans of pea soup, five cans of veggie soup and four cans of onion soup. He neglects to indicate the contents of the unlabeled cans. You need two cans of onion soup to make your stew. FTPT two cans selected at random will both contain onion soup.

7. A basket contains twelve red apples and eight green apples. Four apples are selected at random from the basket. Find the probability of each of the following events
 - a) all four apples will be red
 - b) all four apples will be green
 - c) three apples will be red and one green
 - d) more apples will be green than red.

8. In the game of poker, a hand of 5 cards is dealt to each player from a shuffled deck of 52 cards
 - a) FTPT a hand contains a heart flush (all 5 hearts)
 - b) FTPT a hand contains a full house of 3 jacks and 2 fours
 - c) FTPT a hand contains any full house (3 of a kind and 2 of another kind)
 - d) FTPT a hand contains four of a kind

- e) FTPT a hand contains a straight (5 cards in sequence not all the same suit with ace high or low)
9. You are hired by your local member of parliament to conduct a survey on unemployment, crime, taxes and mail delivery. You make up a question on each topic for your survey sheet. If the questions are arranged in random order on the sheet, find the probability of each of the following
- a) the question about mail delivery will be first
 - b) the question about mail delivery will be first and the one on crime will be second
10. You have 15 5 ½ inch computer disks. Five of these are for the Apple IIGS computer, and ten are for the ICON. A friend who owns an Apple takes four disks from your box at random. FTPT none of these disks will be for the Apple.
11. The president of a NATO country must appoint four of the country's twelve cabinet members to a highly sensitive NATO committee. Unknown to the president, two spies from a non-NATO country have infiltrated the cabinet. If the four chosen are selected at random, what is the probability that neither of the two spies will be chosen?