

Lab 3

1. Tom is playing a game on the Price is Right. He is given 4 tags with prices on them. There are 4 items. In order to win an item, he must place the correct tag on the item.
 - (a) How many ways can he arrange the tags?
 - (b) If he is given 5 tags, how many ways can he arrange the tags?
 - (c) If he is given 5 tags and there are only 3 items, how many ways can he arrange the tags?
2. A meeting is held with 8 individuals. If each person shakes hands with another person only once, how many handshakes occurred at the meeting?
3. A secretary types four letters (a,b,c,d) and their respective envelopes (A,B,C,D). Suppose that the letters are put randomly into the envelopes, one letter in each envelope.
 - (a) How many outcomes are there? List them.
 - (b) List the outcomes of the event A that exactly three letters end up in the wrong envelopes.
 - (c) Find $P(A)$
4. Bob bought a used cell phone from a friend but forgot to ask what the 4 number password was to unlock it. What's the probability that Bob guesses the correct password.
5. Find the probability of winning the jackpot for Lotto 649 (you pick 6 numbers from 49 and you can't pick the same number more than once) if you bought one ticket containing one set of numbers.
6. Find the probability of winning the jackpot for Super 7 (you pick 6 numbers from 49 and you can't pick the same number more than once) if you bought one ticket containing 3 different sets of numbers. Are your chances of winning higher for Super 7?
7. A meeting is attended by 10 doctors, 7 psychologist and 3 psychiatrists.
 - (a) Find the number of ways that they can
 - (i) elect a president
 - (ii) elect 2 representatives
 - (iii) elect 2 representatives where one is president and the other VP
 - (iv) elect 2 representatives that are doctors
 - (iv) elect 2 representatives (1 doctor and 1 psychologist)
 - (vi) elect 3 representatives (1 doctor, 1 psychologist and 1 psychiatrist)
 - (vii) elect 4 representatives (2 doctors, 1 psychologist and 1 psychiatrist)
 - (viii) elect 4 representatives where there is a president, VP, secretary, and accountant and where 2 of the positions have to be filled by a doctor and the other two by a psychologist and psychiatrist.
 - (b) Find the probability of questions (iv) through (viii) in questions (A)

8. Prove that $C(3,0) + C(3,1) + C(3,2) + C(3,3) = 8$
9. Prove that $C(10,4) = C(9,3) + C(9,4)$
10. You roll two dice. Let i denote the smaller of the two numbers appearing on the two dice. Determine the probability distribution of i ,

All the questions in chapter 2 and all the questions in chapter 3 dealing with the sections prior to 3.5.