

Name .....

row. .... col....

1.a	1.b	1.c	1.d	2.a	2.b	2.c	2.d	3. .

1.	2.	3.	4.	5.	6.	Σ.

1. There is a row of  $3n$  chairs and  $n$  people. In how many ways can they sit if
  - a) people are different,
  - b) people are identical,
  - c) people are identical and between any two of them there is at least one free chair,
  - d) people are identical and between any two of them there are at least two free chairs.
  
2. There are  $n + 1$  computers and  $n$  different rooms. In how many ways can we place computers in rooms if
  - a) computers are different,
  - b) computers are identical,
  - c) computers are different and in every room there is at least one computer,
  - d) computers are identical and in every room there is at least one computer.
  
3. In how many ways can we give 10 different cookies to 4 children if the first child gets one cookie, second 2 cookies, third 3 cookies and fourth 4 cookies?
  
4. How many words can be made by permutating letters of the word *mathematics*? What if every consecutive letters are to be different?
  
5. Show by combinatorial arguments that  $\binom{n+m}{2} = \binom{n}{2} + nm + \binom{m}{2}$ .
  
6. Show that  $P(2n, n)$  is equal to the number of all partitions of  $n$ .