Answer on question 34134 – Math – Combinatorics

in how many ways can a committee of 5 be formed from agroup of 11 people consisting of 4 teachers and 7 students if

- there is no restriction in the selection?

- the committee must include exactly 2 teachers?

Solution

We have 11 people. The number of ways to choose 5 of them is

$$C_{11}^5 = \frac{11!}{5!\,(11-5)!} = \frac{11*10*9*8*7}{2*3*4*5} = 462.$$

the number of choosing 2 teachers from 4 is

$$C_4^2 = \frac{4!}{2!\,2!} = 6$$

And the number of ways to choose 3 students of 7 is

$$C_7^3 = \frac{7!}{3!\,4!} = \frac{7*6*5}{6} = 35.$$

If committee must include exactly 2 teachers then the number of ways to choose such committee is 6*35=210.

Answer: 462 and 210.