2.5/2.6 Combinations

Permutations ⇒ order is important.

exs) passwords
postal codes
liscence #
positions of people

Combinations ⇒ order is not important

exs) toppings on pizza
choosing people for a committee
choosing marbles from a bag

Formula (given)

$$ {}_nC_r = \frac{n!}{r!(n-r)!} $$

$$ * \; {}_nC_r = \binom{n}{r} $$

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How many 5-person committees can be formed from a group of 6 women and 4 men if,

a) no conditions $_{10}C_5 = 252$

b) There must be exactly 3 women.

3W 2M $\quad {}_6C_3 \cdot {}_4C_2 = 120$

c) There must be exactly 4 men.

d) There are no men $\quad {}_4C_4 \cdot {}_6C_1 = 6$

5W $\Rightarrow \; {}_6C_5 = 6$

e) There must be at least 3 men.

case 1

3M & 2W

${}_4C_3 \cdot {}_6C_2$

case 2

4M & 1W

${}_4C_4 \cdot {}_6C_1$

$60 + 6$

Total: 66