

PC40S Combinations

1.) Evaluate:

a.) ${}_{12}C_4$

b.) ${}_5C_5$

c.) ${}_{120}C_{115}$

2.) Evaluate each pair and explain your results.

a.) ${}_{10}C_3$ and ${}_{10}C_7$

b.) ${}_5C_3$ and ${}_5C_2$

3.) If ${}_nC_r = 120$, then what other combination must also produce an answer of 120?

4.) In how many ways can four policemen be selected for special duty from a group of 12 policemen?

5.) Tasha's wardrobe includes five slacks, eight blouses, and five pairs of shoes. She wants to select three slacks, four blouses and three pairs of shoes for her camping trip. What is the number of selections Tasha can make?

6.) In a class of 30 students, each student shakes hands with each of the other students once. How many handshakes are there?

7a.) How many different five card hands can be dealt from an ordinary deck of 52 cards?

b.) How many of these hands contain five cards of the same suit?

8.) Lotto 6-49 is a lottery in which one selects six numbers from 1 to 49. How many ways can a selection be made?

9.) A lady gives a dinner party for six of her nine friends.

a.) In how many ways can she choose her six friends?

b.) In how many ways can she choose her six friends if Dorothy and Abby will not attend together?

10a.) In how many ways can three strangers choose hotels in a town with seven hotels?

b.) In how many ways can three strangers choose the hotels if two of them are from different parties and refuse to stay at the same hotel?

c.) If one of the hotels has room for only two more people, in how many ways could the three strangers find accommodations?

- 11.) On a Senior 4 Mathematics examination, students must answer exactly five of the first six questions and three out of the last five questions. In how many ways can this be done?
- 12.) How many committees of five can be chosen from 10 girls and eight boys so that the girls have a majority on the committee?
- 13.) The ambassador is arranging a garden party. If Peter is invited, Carole must not be invited and vice versa. If Tom is invited, the Roxanne must be invited and vice versa. If the ambassador wishes to invite eight guests and her list has 10 names (the four people above being on this list) in how many ways can this be done?
- 14.) How many five card hands are possible consisting of two pairs and one different card?
- 15.) A tennis club has 10 boys and 8 girls as members. From amongst these members how many different matches are possible with:
- a boy against a girl?
 - two boys against two girls?
 - a boy and a girl against another boy and girl?
- 16.) A committee of five is to be selected from nine persons. In how many ways can this selection be made if:
- Jack must be on the committee?
 - Jack must not be on the committee?
 - Compare the sum of a and b with ${}_9C_5$.

Answers:

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| 1a.) 495 | 11.) 60 |
| b.) 1 | 12.) 5292 |
| c.) 190 578 024 | 13.) 13 |
| 2a.) both equal 120 | 14.) 123 552 |
| b.) both equal 10 | 15a.) 80 |
| 4.) 495 | b.) 1260 |
| 5.) 7000 | c.) 2520 |
| 6.) 435 | 16a.) 70 |
| 7a.) 2 598 960 | b.) 56 |
| b.) 5148 | c.) 126 |
| 8.) 13 983 816 | |
| 9a.) 84 | |
| b.) 49 | |
| 10a.) 343 | |
| b.) 294 | |
| c.) 342 | |