Suggested Problems

1. Inside a closet, there are four shirts and three pair of pants. How many outfits can be made containing one shirt and pair of pants?

2. Inside a closet, there are four shirts and three pair of pants. How many outfits can be made containing one shirt or pair of pants?

3. In how many different ways can three of the five letters A, B, C, D, and E be arranged, if no letter is repeated?

4. In how many different ways can three people from a group of five married couples be arranged if no two people of three may be married to each other.

5. How many 3–digit integers contain three different digits?

6. How many different groups of 3 different books can be made from a group of 8 different books.

7. If fifteen tennis players are in a tournament and each player must play every other player once, how many matches must be played?

8. From a group of 6 professors and 8 students, how many committees can be formed containing exactly 2 professor and 3 students?

9. From a group of 6 chemists and 4 biologists, how many three–person committees can be formed containing at least one biologist.

10. From a group of five married couples, how many committees of four or five people can be formed if no two people on the committee may be married to each other?

11. In how many ways can a group of six people, of whom three are men and three are women, be arranged in a row of six seats if no two people of the same gender may be seated next to each other.

12. From a group of 8 junior employees and 4 senior employees, how many different teams of four can be formed, if each team must have a greater number of junior than senior employees.

13. In an international student exchange program, 5 different countries are each represented by 5 students. How many different 4–person committees can be formed from the students at the exchange program if no committee is to have two people representing the same country.

14. A small country will generate identity code of its citizens. Each code will contain four or five characters drawn from the 26 letters of the alphabet and the 5 least digits. What is the maximum number of people who can uniquely designated under such a system?

15. A row of seven chairs must be filled by seven different students from a group of 4 graduate and 5 undergraduate students. If each seat must be filled with either an undergraduate or a graduate student, how many different arrangements of students for the seven seats are possible?

16. The 16 players in a chess tournament must each play every other player in the first round tournament. Only half of the 16 players will play the second round, each player will play every other player, and only half of them will play in the next round, a pattern that will continue until one winner is left. How many chess games will be played in the tournament?

17. How many 4 digit number have 1 or 6 as their 100 th digit and 2 as their 1 st digit?

18. How many outfits does Sally have if she has 5 shirts, 5 pants and 2 hats?

19. How many group of 5 people can you form of 10 people?

20. How many ways can you arrange 5 books on a shelf?

21. How many ways can you pick 2 co–captains on a team of 20?

22. In a 50 person race how many wayscan you award gold, silver and bronze?

23. If there are 10 people on a committee. How many ways are there of choosing a president, vice president and secretary?

24. If there are 30 people on your tennis team. How many ways can you choose 2 co-captain?

25. If a board has 10 women and 7 men. How many ways can you form committee containing 4 members such that
    (a) All 4 are men?
    (b) Two are men and two are women?
    (c) At least one is a women?

26. How many ways are there of being dealt a 5 card hands out of a standard 52 cards deck if
    (a) All are diamonds?
    (b) Contains exactly one face card?
    (c) No queens?
    (d) All hearts or all spades?
    (e) At most one club?
    (f) What is the probability of being dealt all number cards?
    (g) What is the probability of getting at least one ace?