

Counting Problems

Solve the following problems:

1. A leading car manufacturer asks one of their employees to conduct a survey to determine what features people most desire in a new car. How many ways can the employee choose people to answer a questionnaire if he is given a list of 30 car owners and told to interview **at least** 27 of them?
2. An apartment building is soon to be opened. There are 8 apartments per floor. Seven prospective tenants request apartments on the first floor. How many ways can they be assigned apartments?
3. How many “words” can be formed using the letters of the word TRIANGLE ?
4. How many ways can 33 football players line up before a game?
5. How many ways can 10 football players go into a huddle around the quarterback?
6. How many ways can 7 beads be placed on a circular chain if 2 are identical and must remain together?
7. How many ways can a dozen marbles be selected at a shop where they sell 5 kinds of marbles?
8. How many ways can an arrangement of four letters be made out of the letters of the word: *choice and chance*?
 - a) all four alike
 - b) three alike and one different
 - c) two alike and two others alike
 - d) two alike and the other two different
 - e) all four different
9. How many ways can two sixes, three five's, and one one be thrown with six dice?
10. Out of 15 conservatives and 12 liberals, how many committees can be made consisting of 4 conservatives and 4 liberals?

11. Pryor's Pizza Parlor sells plain cheese pizzas or cheese pizzas with any or all of the following toppings: garlic, mushroom, olive, hot pepper, sweet pepper, and anchovy. How many different ways can a pizza be ordered?
12. The head of the motor vehicle bureau anticipates 800,000 cars will need new license plates next year. If the license is to consist of two letters followed by digits, then how many digits would be necessary to accommodate the anticipated demand?
13. How many ways can a concert program be made up if there are to be 3 songs sung by a soprano, 2 violin selections and 5 orchestrations and the soprano is to be on stage and the soprano is to be on stage at one time?
14. A banquet is being held for the athletes participating in the winter games in Italy. How many ways can they be seated on one side of the guest table if they are to be grouped by country and there are four athletes each from the following countries - Austria, Denmark, Italy, Japan, Norway, Russia, and the USA.
15. A certain college has agreed to admit an equal number of men and women to their freshman class. How many ways can a freshman class of 400 be chosen if there are 529 qualified men and 286 qualified women who have applied to the college?
16. How many ten digit numbers can be formed from the digits 1, 2, 2, 3, 3, 3, 4, 4, 4, 4 ?
17. How many ways can a manager assign 18 different typing jobs if he gives 8 to the first typist (because she is the fastest) and the rest equally to two other typists?
18. Mr. Silver owns a fleet of fishing ships. At times the ships must communicate with each other, so Mr. Silver has equipped each ship with a flag pole and three different colored signal flags. How many different messages can they convey if each message ?
(use one flag) + (use 2 flags) + (use 3 flags)
19. How many different ways can a person be dealt a flush in a game of poker?
20. What is the probability of drawing a flush in a game of poker?