Permutation

Permutations: the different possible arrangements of a set of objects.

The number of permutations of n objects taken r at a time is:

$$P(n,r) = \frac{n!}{(n-r)!}, \quad n \geq r.$$

If $n = r$, then

$$P(n,r) = n!$$

Practice Exercises

Solve each permutation problem completely.

1. A teacher wants to assign 4 different tasks to her 4 students. In how many possible ways can she do it?
2. In a certain general assembly, three major prizes are at stake. In how many ways can the first, second, and third prizes be drawn from a box containing 120 names?
3. In how many different ways can 5 bicycles be parked if there are 7 available parking spaces?
4. There are 8 basketball teams competing for the top 4 standings in order to move up to the semi-finals. Find the number of possible rankings of the four top teams.
5. In how many different ways can 12 people occupy the 12 seats in a front row of a mini-theater?

Problem Set

Solve each permutation problem completely.

1. How many 4-digit numbers can be formed from the digits 1, 3, 5, 6, 8, and 9 if no repetition is allowed?
2. If there are 10 people and only 6 chairs are available, in how many ways can they be seated?
3. In how many different ways can a president, vice president, a secretary, and a treasurer be chosen from a class of 15 students?
4. In how many different ways can a first, second, and third prizes be awarded in a game with eight contestants?
5. If four persons enter a bus on which there are ten vacant seats, how many ways can the four be seated?