

Combinatory Elements in Primary Schools

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Annotation: This article covers ways to solve logical problems in mathematics in the primary grades, to give students an understanding of the elements of combinatorics and probability theory, and to teach them examples and problem solving in international standards.

Keywords: Combinatorics, combination, Leibniz theory, probability theory, selection, set, combination, combinatorial problems, addition rule, multiplication rule.

"The main goal of school education is not to train specialists, but to bring up a spiritually mature person."
(Albert Einstein)

Combinatorics is the branch of mathematics that studies choices and the relationships between them. The term "combinatorics" was first introduced to science in 1666 by the German mathematician Leibniz.

The main purpose of combinatorics is to determine the number of combinatorics objects under consideration. An element of a set that is considered to be an object of combinatorics is said to have an element with a certain property. From the elements of a set of mathematics, the problem of creating various combinations (combinations) that satisfy the required conditions is called the field of combinatorics. In probability theory, it is customary to say "selection" instead of "combination." In combinatorics, selection is found in the methods of placement, substitution, grouping.

Definition. Combinatorial problems are problems involving the selection of sub-sets of elements that have a specific property within a finite set of elements, or the placement of elements of a set in a certain order.

Definition. Mathematical science that deals with combinatorial problems is called combinatorics.

In combinatorics, there are two basic rules called the rule of addition and multiplication. Because these rules are the simplest to explain, elementary students are also taught logical structure. Designed for gifted students, the following topics encourage students to think logically and find answers to interesting questions.

Add rule. If it is possible to make one choice in method a, another choice in method b, and here the method of arbitrary selection of choice a differs from the method of arbitrary selection of choice b, then the number of ways to make choice a or b is found by the formula $n = a + b$.

There are 3 red and 5 blue pencils in the pen. How many different ways can you choose a pen from it?

20 B) 15 C) 8 D) 13

Solution: $3 + 5 = 8$

Answer: C

There are 4 pomegranates, 5 pears and 6 apples in the basket. How many different ways can you choose a single fruit from a basket?

15 B) 120 C) 74 D) 10

Solution: $4 + 5 + 6 = 15$

Answer: A

Multiplication rule. If one choice can be made in method a and another choice can be made in method b, then the number of ways to make choice a and b is found by the formula $n = a \cdot b$. There

are 6 roads to the spring on the hill. How many ways can a tourist get to the spring if he does not return?

A) 36 B) 30 C) 22 D) 11

Let's try to think logically to solve this problem. The tourist can reach the spring in 6 ways. So we have 6 combinations. Under the terms of the case, he should not follow the path he took on his return. The tourist went one of the 6 routes and now he has a choice of 5 routes to return. We find the solution by multiplying the combinations by the multiplication method.

Solution: $6 \cdot 5 = 30$

Answer: B

There are 5 white, 2 red and 4 yellow roses. How many ways can you make a bouquet of three different flowers?

A) 24 B) 11 C) 18 D) 40

Depending on the size of the yard, only one or two flowers will fit. So this is in line with the multiplication rule of combinatorics. We have 5 combinations because we have 5 white flowers, 2 combinations to choose from 2 red flowers and 4 combinations to choose from 4 yellow flowers. Depending on the nature of the problem, we increase the number of possibilities to create a bouquet of three different flowers.

Solution: $5 \cdot 2 \cdot 4 = 40$

Answer: D

Conclusion:

The purpose of including combinatorial issues in the primary school curriculum is to provide students with knowledge that meets international educational standards. It is possible to understand the world through mathematics. This work can be easily explained by the vital issues of combinatorics. Because it's not a difficult science, it's a difficult explanation.

References:

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