increased much resulting in 87%. This proves the effectiveness of the new method that evoked the interests of students in math and helped to provide the concepts.

Evaluate	First month results (without digital resources)	Second month results (with digital resources)
Classroom activity	56%	72%
Homework assignments	65%	87%
Motivation	62%	72%
Examination	68%	79%

Table1. The results of experiment

Furthermore, comparing motivation level during two months I have also seen the increase. If it was about 62% then after the new method have been integrated this number was equal to 72% (Table1). Finally, digital resources showed positive impact of their usage on the achievements in the exam. The percentage has increased from 68% to 79%. I have also observed some positive impacts of the use of digital resources. Previously, the two students out of 22 were not paying an attention to the class. However, after we shifted to the combined method they were all engaged. Thus, it illustrates that digital resources increase the interest of he students.

In conclusion, we have seen that the first important thing of the teaching process is to evoke students' interest and motivate them. The use of interactive digital resources help to deal with this task. This method forms alive environment for the learning, increases intellectual activity of students, improve the effectiveness of the study and makes it interesting to learn mathematics. We saw that digital resources facilitate the student-teacher co-operation. I have mentioned the wide range of opportunities that can be provided by the new method. Thus, I think that if the teacher picks up the right combination of both traditional and digital lessons then the method will be effective for the teaching.

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UDC 519.23

METHODOLOGICAL EXCEPTIONS OF THE USE OF COMBINATORAL ELEMENTS FOR PROBABILITY CALCULATION

Bekmukhamedova Dinara Arappayevna
arappaikyzy@mail.ru

Department of Fundamental Mathematics, LN Gumilyov ENU, Nur-Sultan, Kazakhstan
Research supervisor - Dzhumabaeva A.A.

Combinatorics is a branch of mathematics. “Combinatorics” comes from the Latin word “Combina” - add. In fact, to get any combination, we create it by connecting the individual elements in a sequence. These elements are selected from some finite sets.

In this case, the most important rule of combinatorics - the rule of multiplication - helps to calculate the total number of possible combinations. [1, c175]

Today, combinatorics has become one of the fastest growing areas of mathematics. This is because this theory is widely used in electronic computers, information theory and probability theory. Even in the so-called discrete mathematics, the theory of these compounds has a great influence. Problems that need to be answered in different ways are called combinatorial problems. The field of mathematics that deals with such problems is called combinatorics. Teachers and teachers of domestic universities are actively working on the study of elements of combinatorics. On this issue, K.B. Bektaev, B.S. Zhanbyrbaev, R.T. Keltenova, N. Akanbaev, O.M. Meiramkulov, K.Z. Serikbaev, R.G. Meirmanova, M.Yu. Bekbachaev, N. S. Sakhanov, K. N. Bagisbaev, A. K. Kazeshev, S. A. Nurpeisov, K. Kanlybaev and other scientists and teachers conducted scientific and pedagogical research. [1, c174]

The theme of elements of combinatorics was first implemented in schools in 1973-1975. As part of optional work. From the 1975-1976 school year, this topic was taught in the new compulsory program. Later, in the 1980s, this section of mathematics was excluded from the school curriculum. Thus, for almost a quarter of a century, methods for solving and teaching problems of combinatorial analysis have not been studied both in higher education and in higher educational institutions. Today, combinatorics, algebra of random cases, and elements of the theory of statistics have a real place in the textbooks of a number of authors of the country, as well as in the content of the new standard mathematical program for grades 5-6 of Kazakhstan. Secondary schools do not yet have experience in teaching the topic of the foundations of probability theory, so elements of combinatorics and a description of the course of its application in probability theory may be of interest. [3, p 15]

The main mistake in teaching combinatorics at school is, first of all, to learn to count numbers without creating combinations. Combined tasks must precede or take place in parallel with the problem of calculating the number. To do this, it is necessary to discuss the logic of using or choosing trees, consider the types of various combinations (without using special terms and formulas for their calculation).

In the previous lecture, we dealt with the creation of simple combinations, considering all possible experiments. Several objects took part in the experiment (balls, cubes, coins, gloves, etc.). Now back to this question.

As we said above, trees can be used to highlight combinations, but our experience with schoolchildren shows that they are not so special. This is because when there are few elements, combinations can be mentioned without the use of trees, and when there are many elements, the tree branch becomes very large and quickly branches.

This section presents the basic rules for calculating combinations: the rules of multiplication and addition. The addition rule is one of the methods for solving combinatorial problems. If you do not use the multiplication rule when calculating combinations, try using the addition rule: divide the combinations into non-matching classes, calculate the number of combinations in each class, and then add these numbers.

The ability to choose combinations and calculate them using the rules of multiplication and addition is the basis of the combinatorial culture of schoolchildren and the successful solution of many combinatorial problems.

An introduction to the basic types of combinations begins with substitution. Counting the number of substitutions is easy for students and is a great example of applying the multiplication rule.

The problem of selecting all substitutions is complex. It will be a good idea for students to formulate the basic rules for choosing substitutions on their own, and if there are students in the class who are engaged in programming, they may be asked to create a program for choosing combinations.

Placements summarize the concept of replacements. Placements play a more important role than substitution in solving probabilistic tasks, because they create a unique selection scheme: M selects N objects without gradually returning them from the object. Each result of such an experiment is a placement from M to N. As with substitutions, the number of placements can easily be multiplied by the rule.

When calculating the number of substitutions and placements, students first get acquainted with the concept of factorial. Paying attention to them at this time, you can talk about his wonderful holiness, paying attention to them in due time. Students must N! It is necessary to calculate the first few values of how quickly the value increases, and evaluate their value for large values of N. 100 for programmers! It is a good idea to write a program that records all the digits of a number. (Calculate for mathematicians how many zeros are at the end of this number). [4, c 134]

n addition to the traditional rules of addition and multiplication, we consider two other combinatorics rules: subtraction and division. These are general methods for solving problems, such as the addition rule: the subtraction method is used when it is easy to calculate combinations that do not have a given property, and the division rule is used to calculate combinations several times. The section presents the most important combined dials for further probability calculations.

You can calculate the number of substitutions and placements without using a formula (you need to know the rules of multiplication), and when calculating the probability it is very difficult to calculate the number of sets without a formula. The instant sampling scheme is based on the dials: the M object is taken immediately from the M object. Each result in this experiment is a set from M to N.

When choosing a dial, it is important to consider that the dials differ only in composition, i.e., the order of the elements inside the dials does not matter. Therefore, when typing, you must arrange all its elements in ascending order.

The material in this chapter seems to justify the difficulties in studying combinatorics. This chapter contains many interesting probabilistic problems with non-trivial solutions, and they are practical.

In the materials in this chapter, students should feel how powerful a tool they have found in the form of combinatorial rules and formulas for calculating probabilities.

In this example, we will consider random experiments, the result of which are the types of combinations that were discussed above: replacements, placements, sets. The key step in solving these problems is to determine the type of combination, and then it will be easier to calculate the probability.

At the end of the chapter is a model of random experiments in this and previous lectures. It turns out that most of them are reduced from the final set to one of the three classical models for selecting elements. To understand this, a student must have a high level of abstract thinking. Here is the most important aspect of mathematical culture: the basis for seeing the same thing in different ways and different things as one and the same.

To do this, probability theory provides rich material that no other area of mathematics can provide. This gives a real opportunity to test the selected model in practice: it is necessary to conduct a series of relevant experiments and compare the found probabilities with frequency. A computer equipped with appropriate software helps a lot.

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ӘОЖ 372

МАТЕМАТИКАНЫ ОҚЫТУДА ОҚУШЫЛАРДЫҢ ЛОГИКАЛЫҚ ОЙЛАУ ҚАБІЛЕТТЕРІН ДАМЫТУ

Ғалымжанқызы Назерке
Л.Н. Гумилев атындағы Еуразия ұлттық университеті 6М010900 - Математика мамандығының 2-курс магистранты, Нұр-Сұлтан, Қазақстан
Ғылыми жетекшісі – PhD, доцент Ахметкалиева Р.Д.

Аннотация: Бұл мақалада орта мектеп оқушыларының математика сабағындағы логикалық ойлау қабылеттерін қалыптастыру және оны дамыту туралы қарастырылады. Оқушылардың логикалық ойлау қабылеттерін дамытуға мысалдар келтірілген.
Кілт сөздер: логика, логикалық ойлау, логикалық ойлауды дамытуға есептер.

Қазіргі уақытта, көбінесе, өз ойымызды логикалық түрде жеткізу мүмкіндігіміз жетіспейді, әсіресе егер бұл ойымызды жеткізу нәтижесі біз үшін маңызды болған жағдайда. Логикалық ойлау қабілеті бізге табиғатпен тән емес. Логикалық ойлау қабілетімізді өз күшімізбен дамытуымыз керек. Әр сабақ логикалық ойлауды дамытады, бірақ оқушылар көбінесе қалай жалпылауды, қорытындылауды, жіктеуді білмейді. Бұл мақалада, оқушылардың логикалық ойлауын дамыту қаншалықты маңызды екеніне назар аударғым келеді. Алдымен логика мен логикалық ойлау деген не екенін анықтайық. Ол үшін біз В.И. Дальдың түсіндірме сөздігін қолданамыз.

Ежелгі грек тілінен аударғанда, логика сөзі «пайымдау» деген мағынаны білдіреді. Егер логика сөзін термин ретінде қолданылса, онда бұл дұрыс ойлау, ойлау өнері туралы ғылым. Логикалық ойлау – ойлау процесінің түрі, онда адам логикалық құрылымдар мен дайын ұғымдарды қолданады, жағдайларға талдау жасайды және қалыптасқан жағдайларда әрекеттің неғұрлым үздік нұсқаларын таңдайды.

Мақаланың негізгі мақсатына оралайық, сонынмен математика сабақтарында орта мектеп оқушыларының логикалық ойлау қабылетін қалай дамытуға болатынын қарастырайық.

Математиканы оқытуда логикалық ойлаудың дамуы оқушыларды осы пәнге тән ойлау дағдыларын қалыптастырудан тұрады. Сонымен қатар, мектеп оқушыларының ойлау қызметтерінің құрылымына, бекітілген стандартты ережелер, формулалар және оның қолданысы, алгоритмдік дағдылардан басқа, шығармашылық есептерді шешу, білімді жаңа жағдайларда қолдану, айтылған тұжырымдамаларды дәлелдеу үшін эвристикалық әдістердің болуы маңызды. Логикалық ойлауды жүйелі дамыту сабақтан бөлінбеуі керек, әр оқушы оқу іс-әрекетін орындау процесіне қатысуы керек. Әрине, бұл процессті дамыту үшін есептерді шығару көмектеседі. Математикадағы кез-келген мәселенің шешімі, ең алдымен, ойлау тізбегі. Есептерді, түрлендірулерді, есептерді шешуде жиі қолданылатын конструкциялар логикалық негіздемелерсіз мүмкін емес: олар пайымдауға бағытталған. Демек, математикада логикасыз мүмкін емес.