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ASPECTS OF TEACHING MATHEMATICS TO GIFTED STUDENTS IN THE CONTEXT OF INCLUSIVE EDUCATION

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ABSTRACT

The purpose of this article is to point out some aspects of working with talented students of primary school age in the teaching of mathematics in the context of Inclusive Education.

Based on the objective we assigned ourselves the task of creating a system of exercises for studying the topic of "*Counting Possibilities"* which will contribute to the development of the students' logical-mathematical thinking, allowing them to practice skills and knowledge of combinatorial nature. The system components, requirements for the content selection and structure, and teaching methods are presented herein. Technological interpretation of the system of exercises in the study of the topic *Problems of Counting Possibilities* offers methodology for solving problems and demonstrating the ability for it to be integrated in the curriculum of mathematics at the primary stage of education.

Key Words: Inclusive Education, logical-mathematical thinking.

INTRODUCTION

Every teacher strives to educate their students by transferring their own experience so that students can have successful realization. In order for this to happen, teachers must consider the individual characteristics of their students: natural gifts, talents, interests, intelligence, etc.

Each one of us has certain aptitudes and specific strengths in different areas, but one must not forget that abilities develop through perseverance, learning and generated experience. And this is where our role as educators comes. We bare responsibilities and we must help students to develop their intelligence so that they are better prepared for life after school.

METHOD

The emphasis in this paper is on the development of logical-mathematical thinking, as the objective that we set is to point out some aspects of working with talented students of primary school age in the teaching of mathematics in the context of Inclusive Education.

Based on this objective, our goal is to create a system of exercises for teaching the topic "*Counting Possibilities"* intended for students. This system of exercises is realized through mathematics education in an inclusive classroom. Essential part of the learning process, beside the math classes, is the elective and compulsory elective training classes in mathematics.

The main goal in studying the topic "*Counting Possibilities"* is for it to contribute to the development of students' logical-mathematical thinking, allowing them to practice skills and knowledge of combinatorial nature.

The system of exercises was elaborated in consistency with: analysis of mathematics curricula of 1st to 4th grade of the mainstream secondary school on the possibilities of developing students' logical-mathematical thinking; the specific characteristics of learners; our teaching practice studies and the author's opinion that if developed system of exercises is implemented in the mathematics education of students of school age, this will contribute to the formation and development of students' logical-mathematical thinking.

The training content selection and structure requirements for mastering the system of exercises for solving problems of *"Counting Possibilities"* come down to:

- unity of training purpose and content;
- possibility of special teaching by differentiation;
- compliance with the modern science achievements;
- personal experience, interpretation and creativity formation;
- pragmatic orientation and adequate usability;
- determination of students psychological characteristics, and hence in volume and complexity variations;
- openness to current issues;
- reduction in consistent didactic way the modern scientific trends such as dynamism, formalization, mathematization, differentiation, convergence of basic and applied sciences;
- universalization and minimization of the research language and tools.

The system of exercises for solving problems of *"Counting Possibilities"* consists of the following components (Fig. 1):

1. *Practical problems of combinatorial nature*, which can be integrated to the Modeling core on the mathematics syllabus;
2. *Problems of finding numbers and problems of counting numbers with combinatorial nature*, which can be integrated to the Numbers core on the mathematics syllabus;
3. *Geometrical problems of combinatorial nature*, which can be integrated to the Plain Figures core on the mathematics syllabus.

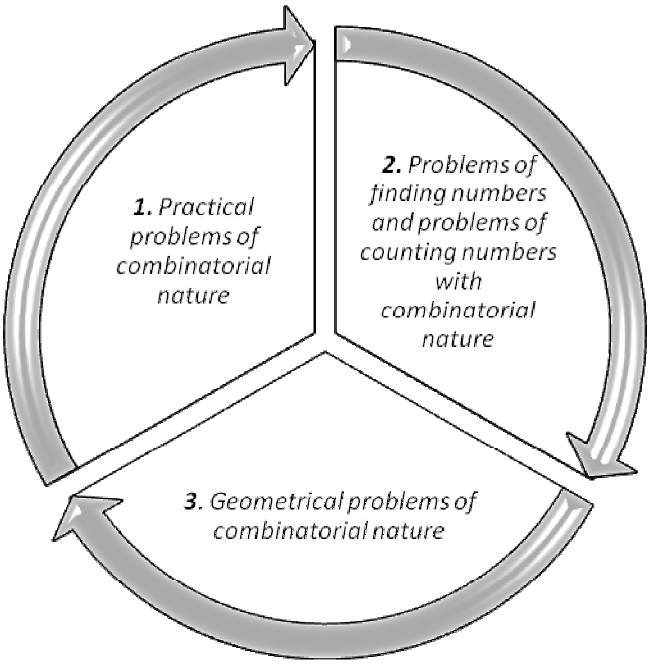

Fig. 1: Components of the system of exercises for solving problems of *"Counting Possibilities"*

Training methods are important part of the education technology. Considering the determinants of training methods, we apply the following groups of methods in our practice (Radev, Legkostup, & Alexandrova, 2013):

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- Direct methods: introduction, announcement and final talk (question-based learning); guided reading participation, observation and thinking; text-method (activities with books and other paper information media); instruction; counseling; activities with digital information media;
- Research methods with learning (educational) purpose: monitoring, modeling, demonstration;
- Interactive methods: discussions, interpretations and debates moderated by the teacher; heuristic conversation; brainstorming;
- Imitation methods: drama and case studies;
- Practically applicable methods (methods for creating experiences): project activities and issues, solving educational problems, various types of exercises.

Technological interpretation of the system of exercises in the study of the subject *Problems* of *"Counting Possibilities"*

The focus here is on building thematically selected problems that allow students to learn and practice skills for solving problems of combinatorial nature. For each problem we provide solving methodology or guidelines.

1. *Practical problems of combinatorial nature*, which can be integrated to the Modeling core on the mathematics syllabus

In order to trigger the interest of young students to the problems of this group we need proper formulation. Here is a problem, presented interestingly, which includes a variety of counting cases.

Example 1. Pippi counts possibilities

Villa Villekulla was in the midst of feverish preparations of Pippi's birthday. Annika and Pippi knead patties, buns and muffins, and the preparation of cakes and chocolate éclairs was yet to begin. Tea and milk were the easiest.

"Do you consider serving everything at once?" – Asked Tommy – You can still decide on the one of the following 12 options:

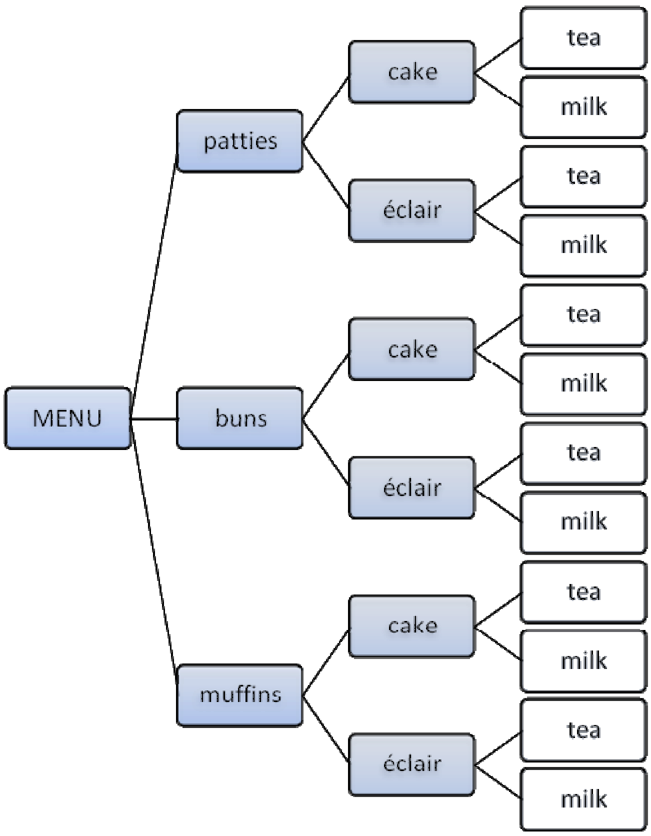

Fig. 2: Graph-tree to determine the possible menus, consisting of snack, dessert and a beverage

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In this way, students get the idea of counting by using graph-tree. It is noted that the number of the last branches of the graph-tree identifies the potential cases.

Annika, who preferred to act more rationally, said:
"There is no need to make such a count in order to calculate the possibilities for the birthday menu, where everyone will get a snack, dessert and beverage. We have three choices for a snack. For each of them there are the two options for dessert. For each such option we have two choices of beverage. "

And Annika determined the number of options for preparing the menu 3 . 2 . 2 = 12.

This "multiplication – pluttification" was much to the delight of Pippi.

"Thus I will be able to celebrate my birthday 12 consecutive days with the food that we have prepared instead of serving it at once today."

Using the ideas of counting possibilities, some students move towards their determination by constructing a graph-tree, while others opt to think as Annika.

The time has come for Pippi to put her festive longstocking.

"Anika, as you know, I have 4 different festive longstocking – red, blue, yellow and pink, in how many ways can I combine them?"

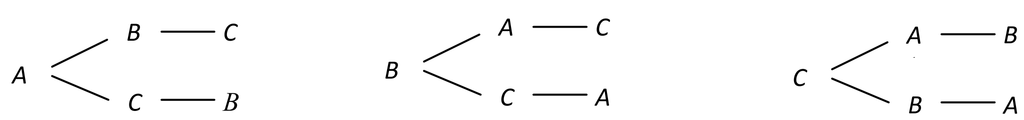
Annika immediately calculated 4 . 3 = 12, noting:
"There are 4 options to choose one longstocking, and then the other three remain. However, any combination of two colors is counted twice. For example, in the twelve combinations is included not only the red-yellow option, but also the yellow-red option. Pairs different only in colors are 12 / 2 = 6."

"This is wonderful! – Said Pippi – Thus I will meet six days of my birthday twelve-days in different color combinations, but in the other six days I will just exchange them on my feet."

I will not tell you how the 12 days of birthday festivities has come to pass, but will give you a hint to some of Pippi's mathematical questions.

- Pippi is curious: *I and my guests are 3 girls and 3 boys. In how many different ways can we line up in two rows for a photo so that the girls at the front and the boys in the back?*

Tommy named the girls with the letters *A*, *B* and *C*. And he made following schemes:



He wrote down all 6 possible different sets of the girls from the first row: *ABC, ACB, BAC, BCA, CAB, CBA*. So are the options for the boys setting. So, in the first row we have 6 options which correspond to 6 options of the second row. Total options are 6 . 6 = 36.

- Pippi asks: *In how many different ways can my five guests sit on the bench in the garden?*

Tommy decided to calculate. And numbered the bench seats with the numbers 1, 2, 3, 4, 5. Seat № 1 can be occupied by any of the five guests, i.e. the seat occupation has five options. If this seat is taken by one of the five, Seat № 2 may be taken by any of the other four guests, i.e. the seat occupation has four options. Thus to occupy the first two seat there are 5 . 4 options. Tommy continues to reason: for the remaining three seats

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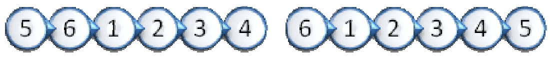
there will be respectively 3, 2 and 1 options. So for the occupation of all five seats there are 5 . 4 . 3 . 2 . 1 = 120 options.

- Pippi is now interested in: *In how many different ways I and my five guests can sit around the round table?*

Witty Annika decided to satisfy Pippi's curiosity again. She clarified that you can easily find in how many ways you can line up six children in a row by copying the Tommy's idea. So she calculated: 6 . 5 . 4 . 3 . 2 . 1 = 720 options. Let's designate such row as follows:

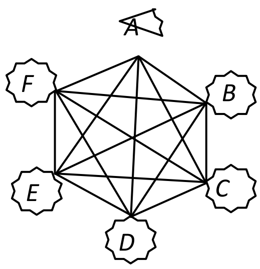
From this row we can obtain another row by moving the first kid to the last position. Continuing in the same way we obtain the following rows:



If children from each of the six rows sit in that order around the roundtable, we will obtain the same setting. Then, the number of all settings arounf the roundtable will be 6 times less than the number of settings in the row, because of the six different settings we obtaine one round. Therefore the number of different ways to arrange the six kids around the roundtable is 720 / 6 = 120. So Annika had quite a hard time determining the number of ways of arrangement of six kids around a roundtable, but still failed.

- *Pippi saw that two out of six kids shook hands. And decided to ask if one can determine the number of handshakes.*

Pippi named the children with the letters: *A*, *B*, *C*, *D*, *E*, *F* and used the following scheme:



She explained that the child *A* shake hands 5 times, child *B* – 4 times (because shaking hands with *A* is already counted), child *C* – 3 times (because shaking hands with *A* and *B* are already counted), child *D* – 2 times, *E* – 1 time, and *F* – no uncounted handshakes. The total of all handshake is 5 + 4 + 3 + 2 + 1 = 15.

- Pippi turned his gaze to the six flowers, which she has cut from her garden. They had different colors: yellow, red, white, pink, purple and blue. She told her guest that she wants to make a bouquet of 3 different colored flowers. And asked with curiosity: In how many different ways I can make such bouquets?

And started making schemes to determine their number. Guests patiently waited for the outcome – 20.
Pippi tried to reason: the first flower can be selected in 6 ways, the second – in 5 ways and the third – in four ways. And quickly calculated that the number of bouquets is 6 . 5 . 4 = 120. She turned to the other children for help.

"Why do you get different results?"

Annika immediately noted:
"Any combination of the three, different color flowers was counted six times. For example, in the resulting combinations is involved not only the option of yellow-red-white colors, but also the options: yellow-white-red, red-white-yellow, red-yellow-white, white-yellow-red, white-red-yellow. So different in color bouquets are 120 / 6 = 20."

Practical problems are presented entertaining and one can continue to ask them. Thus different variations of combinatorial problems are asked, leading to a variety of ways for solutions.

Example 2. Teams consisting of two, three and four students can participate in a race. How many different teams can be set of 8 students?

Solution:
Let's first define the number of different teams, consisting of two students. The first student can be selected in 8 different ways, second – seven ways. But it is necessary to consider, that the pair of students *AB* is the same pair as *BA*. Then the number of different teams of two students is (8 . 7) / 2 = 28. The number of different teams of three students, after taking into account, that the triples *ABC, ACB, BCA, BAC, CAB* and *CBA* should be counted once, was (8 . 7 . 6) / 6 = 56. Similarly, the number of teams of four is (8 . 7 . 6 . 5) / 24 = 70. Then the number of all the different teams is 28 + 56 + 70 = 154 .

Example 3. Group of 7 boys and 4 girls prepare for competition. Out of those we have to choose a team of six children, of whom at least two are girls. In how many different ways can this be done?

Solution:
It is necessary to consider different cases depending on the number of girls, participating in teams.

First case. The team consists of 2 girls and 4 boys.
The choice of the two girls, after taking into account, that the pair of girls *AB* coincides with the pair of girls *BA,* can be effected in (4 . 3) / 2 = 6 options. The four boys are chosen out of seven. First boy may be chosen in 7 ways, second – in 6 ways, third – in 5 ways, and the fourth – in 4 ways. It have to be considered, that the boys four *MNPQ* must be counted once, and these fours are 4 . 3 . 2 . 1 = 24. Then the number of different options of choosing the boys is (7 . 6 . 5 . 4) / 24 = 35. Every girls option corresponds to 35 options of boys selection. Thus, it can be concluded, that the number of different options of compiling teams in this case is 6 . 35 = 210.

Second case. The team consists of 3 girls and 3 boys.
By repeating the reasoning of the first case we obtain, that the number of different options of compiling teams is 4 . 35 = 140.

Third case. The team consists of 4 girls and 2 boys. The number of different option to compile such teams is 21.
Finally, the total of different options to compile teams is 210 + 140 + 21 = 371 .

2. *Problems of finding numbers and problems of counting numbers with combinatorial nature*, which can be integrated to the Numbers core on the mathematics syllabus

Example 4. Write down all two-digit numbers consisting of numbers 1, 2, 3 and 4. How many are they?

Table 1: Presentation of solution to *Example 4*.

	1	2	3	4
1	11	12	13	14
2	21	22	23	24
3	31	32	33	34
4	41	42	43	44

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In addition to using the table, we could think in the following way: for the tens number we have 4 options, and for ones – also 4 options. Thus, the total number is 4 . 4 = 16.

Example 5. How many are the two-digit numbers with different digits, which contain two of the numbers 2, 4, 6 and 9?

Table 2: Presentation of solution to *Example 5*.

	2	4	6	9
2		24	26	29
4	42		46	49
6	62	64		69
9	92	94	96	

In addition to using the table, we can think in the following way:
The tens number may be any of the four digits, i.e. it can be selected in four ways. Having selected the tens number, the ones number can be chosen from the remaining three digits, i.e. in three ways. Thus, the total number is 4 . 3 = 12.

Example 6. How many are the two-digit numbers with different digits, which contain two of 0, 4, 6, and 9?

Solution: Here we must consider that in the formation of two-digit numbers, the tens digit cannot be 0. It can be any one of the 4, 6 and 9, i.e., it may be selected in three different ways. After selecting the tens, we can now use zero. The ones digit can be selected from three digits, i.e. in three ways. Thus, the total number is 3 . 3 = 9.

Example 7. Find the number of all three-digit numbers consisting of 3, 5, 7 and 9.

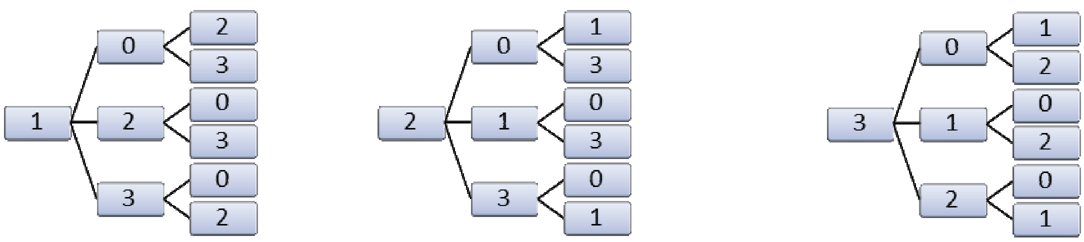
Solution: Each of the hundreds, tens and ones digit, can be any of the four digits, i.e. each digit can be selected in four ways. Thus, the total number is 4 . 4 . 4 = 64.

Example 8. Find the number of all three-digit numbers with different digits, that consist of 5, 6, 7 and 8.

Solution: The hundreds digit can be any of the four digits, i.e. it can be selected in four ways. Having selected the hundreds digit, the tens digit can be selected from the remaining three digits, i.e. in three ways. Then for the ones digit we have two options left. Thus the total number is 4 . 3 . 2 = 24.

Example 9. Compile and count all three-digit numbers consisting of unique 0, 1, 2 and 3 digits.

Solution: it is important to consider the fact that the hundreds number of cannot be zero. We can define the three-digit numbers using a scheme (graph-tree).



It was found, that the numbers starting with 1 as hundreds digit are: 102, 103, 120, 123, 130, 132. If the hundreds digit is 2 we will obtain six numbers: 201, 203, 210, 213, 230, 231, and if it is 3 – six numbers: 301, 302, 310, 312, 320, 321. The total of all numbers is 6 + 6 + 6 = 18.

In addition to using the schemes, we can obtain the number of all three-digit numbers we are looking for, as follows: The hundreds digit cannot be 0. This digit can be any one of the 1, 2 and 3, i.e. it may be selected in three different ways. After selecting the hundreds digit, we can now use zero. The tens digit can be selected out of three digits, i.e. in three ways. Having selected hundreds and tens digits only two options have left for the ones digit. The total number is 3 . 3 . 2 = 18.

Example 10. Find the number of all four-digit numbers, that consist of 5, 6 , 7, 8 and 9.
The solution is similar to that of Example 7. The total number is 5 . 5 . 5 . 5 = 625.

Example 11. Find the number of all four-digit numbers consisting of unique 5, 6, 7, 8 and 9.
The solution is similar to that of Example 8. The total number is 5 . 4 . 3 . 2 = 120.

Example 12. Find the number of all four-digit numbers consisting of unique 0, 6, 7, 8 and 9.
The solution is similar to that of Example 9. The total number is 4 . 4 . 3 . 2 = 96.

Example 13. Find the number of all four-digit numbers with unique digits.
Solution: The number of all digits is 10. It should be considered, that the thousands digit cannot be zero. Therefore, it can be selected in 9 ways. Having selected the thousands digit, now we can use zero. The hundreds digit can be selected out of nine digits, i.e. in nine ways. Having selected thousands and hundreds digits, the tens digit can be selected in 8 ways, then the ones digit – in 7 ways. Thus, the total number is 9 . 9 . 8 . 7 = 4 536.

Example 14. Find the number of all four-digit numbers that are divisible by 5.
Solution: The thousands digit can be selected in 9 ways, the hundreds and tens digit – each in 10 ways, and the ones digit – in 2 ways (0 or 5). Thus, the total number is 9 . 10 . 10 . 2 = 1 800.

Example 15. How many even five-digit numbers can be compiled consisting of 1, 5, 6, 7 and 8?
Solution: For the ones digit we have 2 options (6 or 8). There are 5 options of the digit of any of the remaining five rows. Thus, the total number is 5 . 5 . 5 . 5 . 2 = 1 250.

Example 16. Find the number of all the different five-digit numbers written with unique:
a) odd numbers (Zlatilov, Tonova, Tsvetkova & Pandelieva, 2005);
b) even numbers.

Solution to a): According to the problem, the numbers we seek must consist of 1, 3, 5, 7 and 9. The ten-thousands digit may be any one of these five digits, i.e. it can be selected in five ways. Having selected this digit, the thousands digit can be selected from the remaining four digits, i.e. in four ways. Continue: the hundreds, tens and ones digit can be selected respectively in 3, 2 and 1 ways. Thus the total number is 5 . 4 . 3 . 2 . 1 = 120.

Solution to b): Now the numbers we look for must be consisting of 0, 2, 4, 6 and 8. Since the ten-thousands digit cannot be zero, it can be selected in 4 ways out of the remaining four digits. having selecting the ten-thousands digit, now we can use zero. The thousands digit can be selected in four ways. Having selecting hundreds, tens and ones digit can be selected respectively in 3, 2 and 1 ways. Thus the total number is 4 . 4 . 3 . 2 . 1 = 96.

Example 17. Find the number of all:
a) two-digit odd numbers that are not divisible by 5;
b) three-digit odd numbers that are not divisible by 5;
c) three-digit even numbers that are not divisible by 10.

Solution to a): The tens digit cannot be zero. It may be selected in nine ways. As it required that the two-digit numbers are odd, the ones digit can be 1, 3, 5, 7 and 9. The two-digit numbers must be divisible by 5. Therefore, the ones digit cannot be 5 or 0. The ones digit must be 1, 3, 7, 9, i.e. can be selected in four ways. Thus, the total number is 9 . 4 = 36.

Solution to b): The hundreds digit cannot be zero. It may be selected in nine ways. The tens digit can be selected in ten ways. There are four options for the ones digit (1, 3, 7, 9), according to the condition of the task. Thus, the total number is 9 . 10 . 4 = 360.

Solution to c): The hundreds digit can be selected nine ways. The tens digit can be selected in ten ways. The ones digit, according to the condition of the problem, may be 2, 4, 6 and 8, i.e., can be selected in four ways. Thus, the total number is 9 . 10 . 4 = 360.

The next two examples concern the Palindromic Numbers, i.e. which are read the same way forward and backward. For example, 34543, 8230328, 55555. Those numbers are also met in the literature under the name Symmetric Numbers.

Example 18. How many are the five-digit palindromic numbers? How many of them are odd?
Solutions are as follows:
The symmetrical five-digit numbers are of the $\overline{abcba}$ type.

The digits used to write down the numbers are 10. The ten-thousands digit can be selected in 9 ways (all digits except 0). There are 10 options for the thousands digit, for the hundreds digit – also 10 options. By choosing the ten-thousands digit and thousands digit, we predefine the tens digit and ones digit. Therefore the total number of all five-digit palindromic numbers is 9 . 10 . 10 = 900.

The number of odd single-digits is 5. In this case the selection of the ones digit can be made in 5 ways. For the tens digit there are 10 options, and for the hundreds digit – also 10 options. By choosing the ten-thousands digit and thousands digit, we predefine the tens digit and ones digit. Therefore the total number of all five-digit odd palindromic numbers is 5 . 10 . 10 = 500.

Example 19. How many are the symmetrical numbers consisting of no more than 5 digits? (Zlatilov, Tonova, Tsvetkova & Pandelieva, 2005).

Solution:
There are 10 single-digits. They are symmetrical.

The two-digit symmetrical numbers are 11, 22, 33, ..., 99. Nine in total.

The three-digit symmetrical numbers are of the $\overline{aba}$ type. There are 9 option for the hundreds digit and 10 options for the tens digit. By choosing the hundreds digit we predefine the ones digit. Therefore the total number of all three-digit symmetrical numbers is 9 . 10 = 90.

The four-digit symmetrical numbers are of the $\overline{abba}$ type. In place of *a* we can put 9 digits, and the place of *b* – 10 digits. Therefore, the total number of all four-digit symmetrical numbers is 9 . 10 = 90.

The five-digit symmetrical numbers are of the $\overline{abcba}$ type. Their total number was 900 (defined in *Example 18*). Thus, the number of all symmetrical numbers with no more than 5 digits is 10 + 9 + 90 + 90 + 900 = 1 099.

3. *Geometrical problems of combinatorial nature*, which can be integrated to the Plain Figures core on the mathematics syllabus.

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All problems including counting points, lines, triangles and other geometric shapes fall within this category of problems.

Example 20. There are 8 red, 5 blue and 4 yellow dots placed in a circle. How many sections with different color edges can be built?

Solution:
Each of the eight red dots can be connected to the five blue dots. Therefore, the total number of sections with red and blue ends is 8 . 5 = 40.

Each of the eight red dots can be connected to the four yellow dots. Therefore, the total number of sections with red and yellow ends is 8 . 4 = 32.

Each of the five blue dots can be connected to the four yellow dots. Therefore, the total number of sections with blue and yellow ends are 5 . 4 = 20.

Total number of sections with different color edges is 40 + 32 + 20 = 92.

Example 21. There are 8 red, 5 blue and 4 yellow dots placed in a circle. How many sections with same color ends can be built?

Solution:
Each of the eight red dots can be connected with each of the seven remaining red dots (8 . 7 = 56). But this is double the number of “red” sections.

The number of red ends segments is (8 . 7) / 2 = 28.

Similarly, we find the number of blue ends segments (5 . 4) / 2 = 10.

And the number of blue ends sections is (4 . 3) / 2 = 6.

Total number of sections with same color ends is 28 + 10 + 6 = 44.

Example 22. George drew a circle and marked 4 blue, 7 yellow and a few red dots in it. Then he connected each marked dot to each other. If different color ends sections are a total of 94, how many are the same color ends sections?

Solution:
We designate the number of red dots with x.

Then the number of different color ends sections is 4 . 7 + 4 . x + 7 . x.

Of the equation 4 . 7 + 4 . x + 7 . x = 94 we derive that x = 6, i.e. the number of red dots is 6.

Following the idea of *Example 21* we obtain the number of same color ends sections.

In this case: (4 . 3) / 2 + (7 . 6) / 2 + (6 . 5) / 2 = 6 + 21 + 15 = 42.

Example 23. There are 6 red, 5 blue and 4 yellow dots placed in a circle. How many triangles with different color vertices (red, blue and yellow) can be built?

Solution:

The number of sections with red and blue end is 6. 5. Each such section can be a side of the triangle, according to the problem conditions. The third vertex of the triangle remains to be yellow.

Then the number of triangles with different color vertices is 6 . 5 . 4 = 120.

Example 24. In how many ways one can travel from *A* to *C* (Fig. 3), without passing through the same point twice?

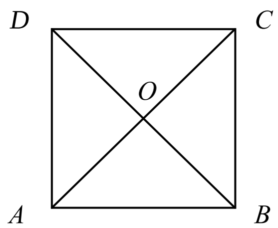
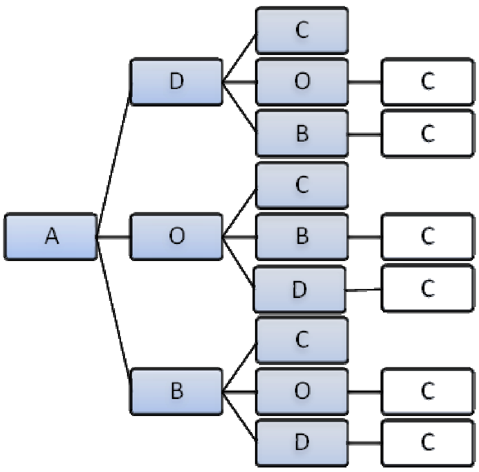


Fig. 3.

Solution:
For the solution to this problem it will be appropriate to build a graph-tree. It is obvious that one can travel from A to C in 9 different ways.



Example 25. There are 4 direct roads from City *A* to City *B*. There are 3 direct roads from City *B* to City *C*, and from City *A* to City *C* – 2 direct roads. Find in how many ways can one get from City *A* to City *C*.

Solution:
One can reach from *A* to *C* via *B* in 4 . 3 = 12 paths.

One can reach from *A* to *C* in 2 direct 2 or 12 indirect paths.

In total: One can reach from *A* to *C* in 2 + 12 = 14 paths.

Example 26. There are 10 direct flights from Airport *A* to Airport *B*, and 4 direct flights from Airport *B* to Airport *C*. One can reach from Airport *A* to Airport *C* in 46 different ways (some direct and some through *B*). Find how has direct flights are there between *A* and *C*. (Paskaleva, Alashka, M. & Alashka, R., 2008).

Solution:
One can reach from *A* to *C* via *B* in 10 . 4 = 40 paths.

Let's designate with *x* the number of direct flights from *A* to *C*.

Then $x + 40 = 46$, $x = 6$.

The total number of direct flights between airports *A* and *C* is 6.

FINDINGS

Based on the implementation of the system of exercises we expect acquiring of knowledge and skills to solve nonstandard mathematical problems in the topic "*Counting Possibilities"* and based on this – formation and development of students' logical thinking.

CONCLUSION

The established system of exercises has an open nature and can be adapted to the constantly changing determinants of primary mathematics teaching in all its forms.

The system of exercises focuses on targeted building of combinatorial competencies in students. It provides an opportunity based on structured learning content and the appropriate set of problems with their methodological developments for build-up and deepening of logical knowledge to students in primary school age. On the one hand, the entertaining elements of the problems aroused the interest and curiosity of students, on the other – practical problems, make it accessible. In this way the traditional teaching process is diversified and students' motivation to learn is increased.

Non-standard problems have great potential, so they need to be integrated in the curriculum of mathematics in the stage of primary school education. The topic presented herein is a proof of this assertion and a way to advance the ideas of logic in the classroom. It is a complete additional resource in the hands of the teacher.

Our common objective in the context of Inclusive Education is to create additional resources such as the above, which enable us to meet the challenges and opportunities for student and teacher development.

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