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PROBLEMS OF FINDING THESE NUMBERS ACCORDING TO THE SUM (OR DIFFERENCE) AND MULTIPLE RATIO OF TWO NUMBERS

BNYuldashev BuxDPI
Senior teacher, Uzbekistan

ABOUT ARTICLE

Key words: Problem, arithmetic problem, typical arithmetic problem, sum, sum of two numbers, difference of two numbers, arithmetic operations, graphical representation.

Abstract: This article is for elementary students Methods of learning to solve problems related to finding two (or several) numbers according to their sum and difference are explained.

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INTRODUCTION

In the literature, there are concepts of "problem", "arithmetic problem", "simple arithmetic problem", "complex arithmetic problem" as well as the concept of "typical arithmetic problem".

It is not difficult to distinguish a series of problems that are performed in the same sequence and solved by the same actions from complex text problems. Such issues can be said to be one type of issues. But complex problems with some important features were accepted as typical arithmetical problems in the methodology course.

A characteristic feature of typical problems is that they are much more difficult than non-typical problems and it is necessary to use special reasoning methods to solve them.

Typical The concept of an arithmetic problem is expressed in many arithmetical literatures, and their specific features, the problem of working on the typical arithmetical problems studied in the elementary school mathematics course has not yet been fully solved. At this point, we want to analyze the ways of solving the problems of finding these numbers according to the sum (or difference) of two numbers and their multiple ratio.

- in the problem, the sum (or difference) of two numbers or amounts and their multiple ratio is given, and it is required to find this number or amount itself.
- a graphic condition (problem model) is created in order to clarify the text of the problem and find a solution.

When creating a graphic condition, the smallest number or quantity was selected as a part (contribution) and conditionally determined by a section of a certain length. From the text of the

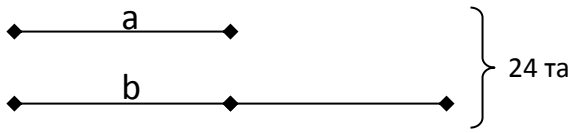
problem, the length of the second section is determined by taking into account the number of times the size of the second number or quantity.

- the problem involves two or more unknown numbers or quantities.
- the solution of the problem begins with the calculation of the number of equal parts. If the sum and multiple ratio of two numbers or quantities are given in the text of the problem, the number of parts is added. If the difference and multiple ratio of two numbers or quantities are given in the text of the problem, the number of parts is divided.
- the problem always has a unique solution method.
- other types of issues may be found within the issue.

Primary school students can solve these types of problems with interest. First, it is appropriate to introduce the problems of finding these numbers according to the sum of two numbers and their multiple ratio. Let's consider the following issue.

Problem: Nadir and Talib picked 24 mushrooms. The number of rare mushrooms collected is 2 times more than the number of mushrooms collected by Talib. How many mushrooms did Nadir pick? How many mushrooms did Talib pick?

this problem to be understandable, let's first give a graphic model representing the short condition of the problem. Since the number of rare mushrooms picked by Talib is 2 times more than Talib's, we express the number of mushrooms picked by Talib with a section "a". Since the number of rare mushrooms is 2 times longer than that, we denote the section 2 times longer than "a" by "b". They are both



We define the number representing 24 mushroom picks.

We will solve the problem with the students as follows.

- you know how many mushrooms Nadir picked?
- No
- How many mushrooms did Talib pick?
- No , it is not known.
- How many mushrooms did they pick ?
- Yes. 24
- Who picked the most mushrooms?
- Rare.
- How many times did Nadir pick more mushrooms than Talib?
- 2 times.
- It is appropriate to say the following here: "How many mushrooms did Nadir or Talib pick? " This question leads students to wrong thinking.

Some students, reasoning by themselves, say to divide 24 by 2 and find the number of mushrooms that Talib picked. This error leads to a solution.

The teacher drew the students to think correctly and from the graphic model "If we take the number of mushrooms picked by Talib as 1 part (contribution), since the number of mushrooms picked by Nadir

is 2 parts more than the number picked by Talib There will be 2 contributions. Then students will find out how many parts (parts) 24 picked mushrooms are.

1+ 2= 3(part)

- to find the number of mushrooms that Talib picked in part 1 ?
- Yes.
- How?
- Divide 24 by 3. 24:3=8(s)
- Who picked 8 mushrooms?
- Talib.
- Can you find how many mushrooms Nadir picked?
- yes Multiplying 8 by 2 gives 8 · 2=16 (the)

The teacher tells them to find out if they solved the problem correctly. Then the students will check the problem.

8+16=24 (times) or 16:8=2 (times) means that the problem is solved correctly.

Now we will try to familiarize the students with the problems of finding two numbers according to their difference and multiple ratio.

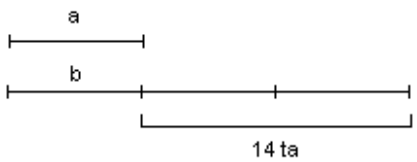
Problem: There are 3 times less geese than ducks in the meadow. If there are 14 more ducks than geese, how many geese and how many ducks are there in the meadow?

This problem $\left.\begin{matrix} a=3b \\ a-b=14 \end{matrix}\right\}$ represents a system of linear equations with two unknowns (where b is the number of ducks in the meadow, and b is the number of geese).

This issue can be solved by discussing it with elementary school students as follows:

- What are the students talking about?
- About geese and ducks in the meadow
- Is it known how many times fewer geese there are than ducks?
- Yes, 3 times
- What else is given in the matter?
- It is known that there are 14 more ducks than geese in the meadow.
- What is the problem asking us to find?
- How many geese and ducks are there in the meadow.

To find a solution to the problem, we first create a graphical condition (model) representing the condition of the problem.



Since there are 3 times less geese than ducks, we choose 1 section representing the number of geese. And since the section representing the number of ducks is 3 times more than the number of geese, this section is 3 times longer than the first section. Since there are 14 more ducks than geese, we represent 2 of the 3 separate sections representing the number of ducks and mark it as 14.

We will continue our observation based on this graphical model. We can see from the drawing that 14 represents two of the sections representing the number of geese. So the number of geese can be found by dividing 14 by 2. When the number of geese is known, the number of ducks is found. The problem is solved in 3 cases. (with subtraction, division and multiplication operations)

Solution: 1) 3 – 1 = 2 (part)

2) 14 : 2 = 7 (each)
3) 7 3 = 21 (each)

Answer: 7 geese, 21 ducks.

To check the correctness of solving the problem, subtract 7 from 21.

21-7=14 (each)

The specific features of the problems "Finding two numbers according to their sum (or difference) and their multiple ratio" are as follows:

- In the problem, the sum (or difference) of two numbers or amounts and their multiple ratio are given, and it is required to find this number or amount itself.
- In order to clarify the text of the problem and find a solution, a graphic condition (problem model) is created.

When creating a graphic condition, the smallest number or quantity was selected as a part (contribution) and conditionally determined by a section of a certain length. From the text of the problem, the length of the second section is determined by taking into account the number of times the size of the second number or quantity.

- The problem involves two or more unknown numbers or quantities.
- The solution of the problem begins with the calculation of the number of equal parts. If the sum and multiple ratio of two numbers or quantities are given in the text of the problem, the number of parts is added. If the difference and multiple ratio of two numbers or quantities are given in the text of the problem, the number of parts is divided.
- A problem always has a unique solution.
- Other types of issues can be found in the structure of the issue.

Recommending the following questions to primary school students for their independent solution will help them to develop the ability to think independently.

Issue 1. Two friends picked 32 walnuts together. If the first one picked 3 times more nuts than the second one, how many nuts did each child pick?

Issue 2. The number of problems solved by Zoir is 4 times more than the number of problems solved by Zarif. If Zarif and Zoir solved 40 problems together, how many problems did Zoir solve?

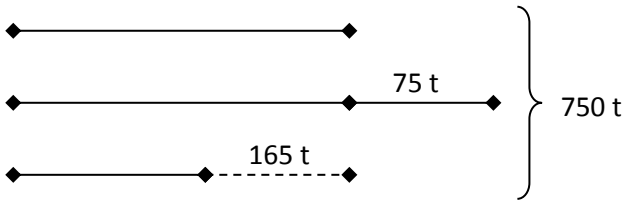
Issue 3. There are 24 pencils in two boxes. Pencils in the first box are 5 times less than in the second box. How many pencils are in the first box?

Dividing complex problems into certain parts (types) and searching for a solution to the problem by solving the part of each type separately gives good results. Let's consider the following issue.

Problem: Three pieces of iron with a total weight of 950 tons were brought to the warehouse. The weight of the iron in the first track was 3 times more than the weight of the iron in the second track and 5 times less than in the third track. Among the iron brought on the third route, the amount of flat iron was 75 t less than the amount of round iron, and edged iron was 165 t less than flat iron. How many tons of flat iron was delivered on the third road?

This issue consists of 2 parts (types). First, let's solve the part about 3 types. In this case, we conditionally define the weight of the iron given in the 2nd way as a unit cross-section:

Solution: We write down the solution by performing the steps one after the other.
1) 1+3+ 1 5 = 1 9 (part)
2) 950:19= 50 (t)-2 irons on the road.
3) 50 · 15=750 (t)-3 irons on the road.
Now we will solve the second part of the problem, the part related to type 2.



We provide a separate graphic condition for this part as well.

Since the question of how many tons of flat iron was brought, it is appropriate to solve the problem by equalizing the amount of round and edged iron to the amount of flat iron.
4) 750+165-75 = 840 (t)
5) 840:3 = 280 (t) flat iron.
Answer: 280 (tons) of flat iron are supplied
this type, which future primary school teachers must be able to solve such problems.
4 . The child is 4 times younger than his mother and his grandmother is 7 times older than her grandson. If you add up the ages of all of them and get 108, how old will each of them be?
5. The farm planted fir trees on 4 pieces of land with a total length of 1800 m and a width of 8 m. The length of the second piece was 2 times more than the length of the first piece and 2 times less than the length of the third piece. The length of the fourth piece was equal to the length of the first and second pieces taken together. Determine the face of the third piece?
6. 810 students study in the school. After transferring 130 students who study in the afternoon to morning study, the number of students who study in the morning will be 2 times more than the students who study in the afternoon. How many students were there in the morning and how many in the afternoon?

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