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Teaching students to solve problems related to sets in elementary mathematics classes

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Abstract: In this article, the explanation of the concept of sets, performing operations on several sets, and solving problems related to sets are discussed in the elementary mathematics classes.
Key words: set, filler, object, problem, Venn diagram, knowledge, skill.

INTRODUCTION

The set is one of the basic concepts of mathematics, and it cannot be described by simpler concepts.

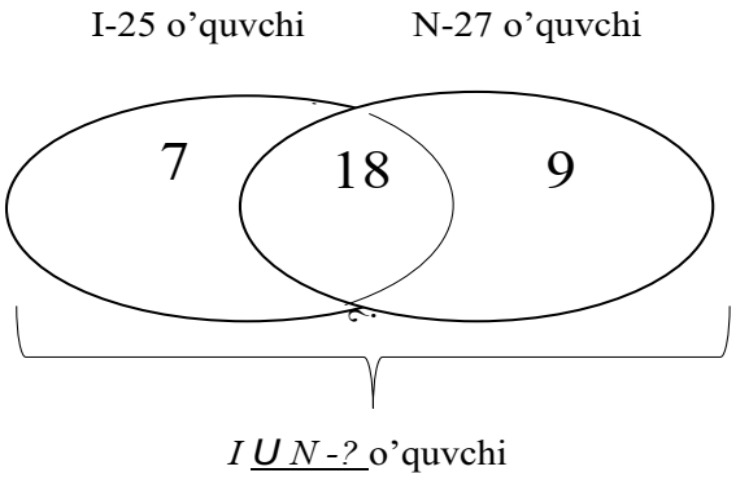
The collection can be composed of objects of arbitrary nature. For example, in the Asian continent, all rivers or all words in the dictionary can be a collection.

The famous German mathematician G. Kantor (1854-1918) introduced the concept of a set to give a mathematical description of sets as follows:

"A set is a plurality considered as a whole in thought."

The objects that make up the set are called its elements. The set is usually, for convenience, the uppercase letters of the Latin alphabet, for example, A,B,C, ... , and its elements are lowercase letters, for example, a,b,c, ... , with is determined. A set A with elements a, b, c, ... is written as A={a, b, c, ... } using brackets.

1. There are several children in the class, some of them are learning English and some are learning German. How many are there in the class?



This task can be solved in several ways.

Method 1.

(25+27)-18=34 students

Method 2.

1) 27-18=9 (student) - only learning German

2) 25+9=34 students

Method 3.

1) 25-18=7 (student) - only learning English

2) 27+7=34 students

Method 4.

1) 27-18=9 (student) - only learning German

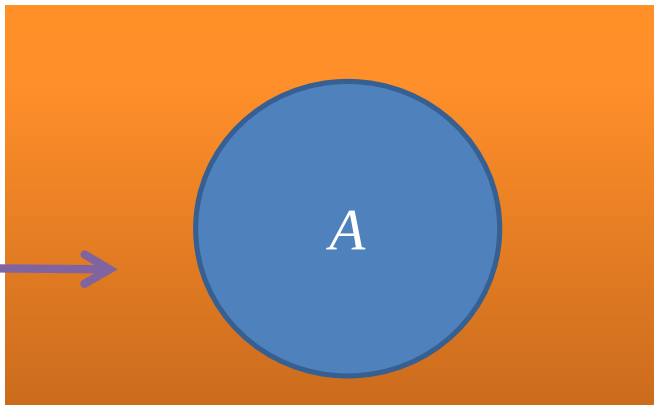
2) 25-18=7 (student) - only learning English

3) 9+18+7=34 students

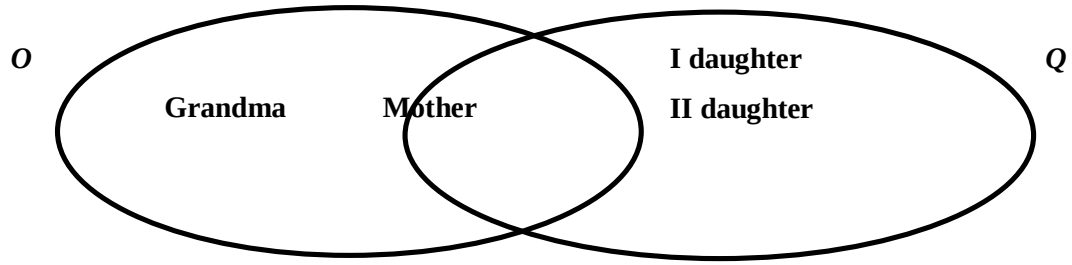
It is appropriate to depict collections using Venn diagrams. In the Venn diagram, the universal set is represented as a rectangle, and the set is represented as a circle lying inside this rectangle.

A' is the complement of A set

U - **It is a universal set**

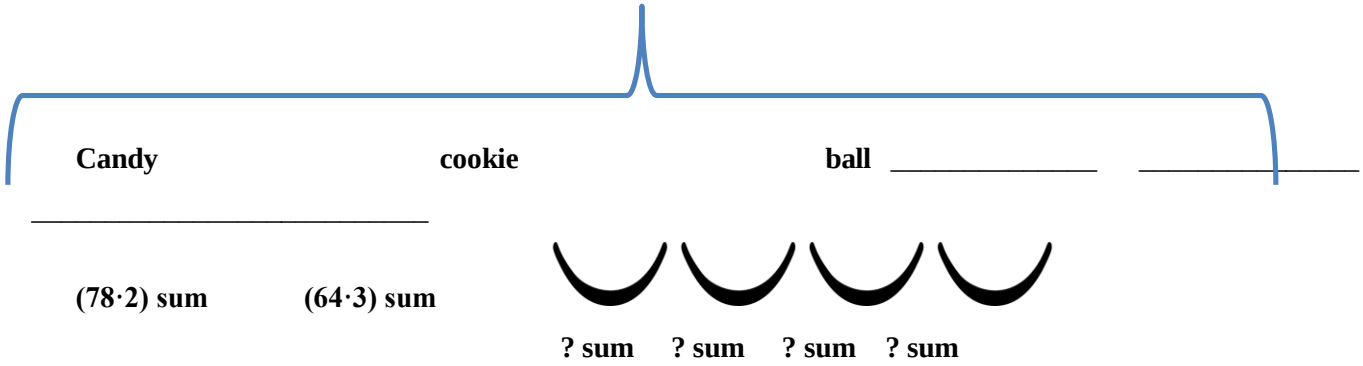


1. When solving text problems about sets, you can analyze the problem by using drawings and diagrams.
2. There is a grandmother, a mother and 2 daughters in the family. This can be illustrated in a Venn diagram like this. Mothers are in the O set, and girls are in the Q set.



3. After the woman spent a few soums, she had 400 soums left. He should buy candy, cookies and 4 cookies for this money. If the candy costs (78•2) soums, and the cake costs (64•3) soums, how many soums does the ball cost?

400 sum



4. Using the drawing, we make a numerical expression of the problem.

1) 78•2 156 (soum) - candy

2) 64•3 192 (soum) - biscuits

3) 156+192=348 soums - candy and cookies together

4) 400-348=52 soums - the money left for 4 small children

5) 52:4=13 soums

Answer: each bun costs 13 soums.

5. 4. If U = {1 , 2 , 3 , 4 , 5 , 6 , 7 , 8} , describe the following set in a Venn diagram:

a) A = {1 , 3 , 6 , 8} and B = {2 , 3 , 4 , 5 , 8}

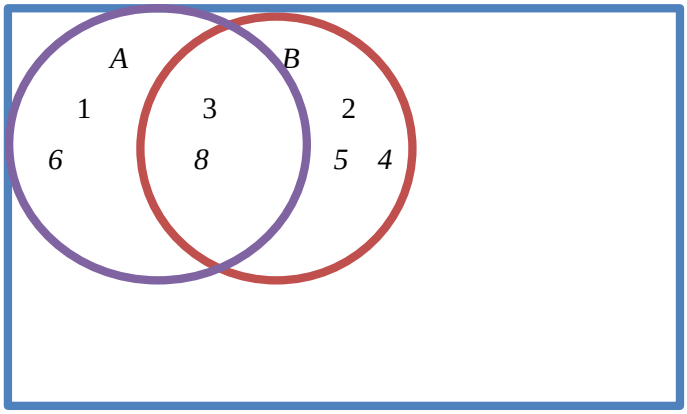
Assignment: $A \cap B$ = ?

$A \cup B` $ = ?

Answer: $A \cap B$ = {3 , 8}

$A \cup B` $ = {1 , 6 , 7}

7



When we study sets, we compare them and look at the relationships between sets, whether they intersect or are equal, or one is a part of the other. Looking at the set of natural numbers, we see various connections between the numbers. For example, the number 7 is greater than the number 6, the number 12 is 3 more than the number 9, the number 3 comes after the number 2, etc.

Similarly, in geometry, relationships such as equality and similarity of figures, parallelism and perpendicularity of straight lines are considered.

It can be seen from these that mathematics mainly considers the relationship between two objects, which is called binary relationship. If we look at the question of whether there is commonality between the relations discussed above, when we look at this or that relation, we see that operations are performed with ordered pairs consisting of the numbers of the given sets.

For example: "5 is 1 more than 4", "6 is 1 more than 5" in the set X={4;5;6}. If we look at the big relationship in this set, "5>4", "6>4", "6>5". Let's look at similar small relations: "4 is 1 less than 5", "5 is 1 less than 6".

In addition, students can be given the following assignments for independent completion:

a) Is it possible to divide the set of angles into right angles, acute angles, acute angles?

b) A set of sounds in the Uzbek language - vowels and consonants;

In life, sets are named separately: a set of students in the auditorium is a group, a set of letters is an alphabet, a set of birds is a flock, a set of sheep is a herd, etc. k.

For example, the set of all natural numbers, the set of students living in the same student house, the set of points on a straight line, the set of students in a school.

It is also necessary to take into account that in elementary grades, problems related to collections are solved through real-life examples, and students develop practical competences related to science. In this case, it is necessary to regularly monitor the accuracy of the necessary practical work from the teacher's novel.

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