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The Fundamental Theorem of Algebra (Without Proof), Equivalent Equations and Theorems about them

Ruziyev Jamshid Xudoyberdiyevich
Academic Lyceum of Tashkent State University of Economics, Teacher of Mathematics

ABSTRACT

This article describes in detail the algebraic theorem and equivalent equations and other related theorems.

KEYWORDS: theorem, mathematical property, algebra, proof, equality, inequality, etc.

In mathematics, the issue of equality of equations and inequalities is very close and interrelated. One can often find that an equation is equal to a system of equations, and an inequality is equal to equations. The concept of equality is based on the concept of "comes from". We will explain the meaning of this concept in the following example. The equation can be reduced to the form of an equation (by squaring both sides of the equation). It can be seen from this that if the equation becomes a real numerical equality at some value of , then the equation at the same value of the variable also becomes a real numerical equality. It is said that the second equation follows from the given equality. Let's look at another example: from inequality comes inequality. Indeed, at some value of , the given inequality becomes a true inequality. Then, based on the transitivity property of the "small" relation, the correct (true) inequality follows from the condition and, i.e., the number is the solution of the second inequality. Therefore, each solution of the first inequality is a solution of the second inequality, that is, the second inequality follows from the first inequality. Equations, inequalities and their systems can be divided into two groups:

1. The first group - rational equations, inequalities and their systems. The most important in this group are linear equations with one unknown, quadratic equations and their corresponding inequalities, and a system of linear equations (inequalities) with two unknowns.
2. The second group is irrational and transcendental equations, inequalities and their systems. This group includes irrational, exponential, logarithmic, trigonometric equations and related inequalities.

In the part-time high school algebra course, students fully master the knowledge of the first group. In the course of the basics of algebra and analysis of the upper class, they study the special forms of materials belonging to the second group and some of their properties. In general, they get to know each other in the courses of algebra and analysis in higher educational institutions. Different forms of equations, inequalities and the sequence of learning their systems are interpreted differently in different textbooks. These can be mainly divided into two. First, equations and their systems are studied, and then inequalities. This method ends with the study of kbadrat uchhads. In the upper classes, logarithmic, exponential and trigonometric equations and their corresponding inequalities are studied independently. The main classes of inequalities are studied after their corresponding equations. The

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existence of these methods has its own positive and negative characteristics. When defining the concept of an equation, the teacher is forced to search methodically for the first time. in such a case, it is appropriate to use a simple textual problem that is reduced to an unknown first-order equation that can be solved algebraically. During problem solving, the students' attention should be directed to the algebraic model with the general form (where and are the same unknown expressions) as the main method. Then the teacher gives the rate of the equation in the textbook through the analysis of the exact formula and enters the corresponding terms. Textbooks treat a first-order equation with one unknown in different ways. For example, Makarechev Y.N. and others in the book "Algebra 6th grade textbook" (under the editorship of S.A. Telyakovskiy) the following definition is given: An equation in the form of an equation with one unknown is said. Here the unknowns and s are known numbers. Such a definition given to the equation has a very narrow meaning and is not enough to solve even the simplest problems. Sh. In the book "Algebra for Grades 6-8" by A. Alimov and others, the one-unknown equation of the first degree is explained through example solutions without giving a precise definition. The main focus of the book is to show the form of the equation using the rule of successive form substitution. In this way, students cannot have a sufficient idea about the equation. Although the definition of the equation is given in different forms, the methodology of its study is essentially the same. When studying one-unknown equations of the first degree, students should acquire the following knowledge: know the algorithm for solving a given equation, be able to use the results of checking the solution of the equation, know the basic concepts in the general theory of equations, be able to use the equations of this class when solving text problems must Matter. One family planted 26 apple bushes and 15 cherry seedlings in their garden for 41.4 soums, and the second family planted 22 apple bushes and 12 cherry seedlings at the same price for 34.2 soums. Determine the cost of each root apple and cherry seedling. It is advisable to solve this problem first using an unknown equation. For this reason, if we say the price of one bush of apple seedlings, 26 bushes of apple seedlings will be 26 soums, and 15 bushes of cherry seedlings will be soums. A bush of cherry seedlings costs one soum. Since both families bought their seedlings at the same price, we make the following equation: Solving the equation (the price of one root of apple seedlings was found). To find the price of a cherry tree, we can put 1.2 in an arbitrary expression in the equation. So, apple seedlings cost 0.9 soums, and cherry seedlings cost 1.2 soums. Let's see how to solve this problem using two letters - two unknowns. If we define the price of apple seedlings as soums, and the price of cherry seedlings as soums, we will draw up the following equations based on the conditions of the problem. To solve the problem, it is necessary to find the values of and satisfying both equations, in other words, to solve the equations together. In such cases, a system of equations of the first order, two unknowns is said to be given, and both are bracketed together. Students are instructed to independently check whether the values given above are systematic answers to the problem. After solving such problems, the system can be defined: The same unknowns make up two or more equations representing one quantity - a system of equations. Solving a system of two equations means finding satisfying values of the unknowns in it. A pair of such values that satisfy the unknowns is called a solution of the system. With such a concept, the solution of two unknown equations is not an arbitrary number, but an ordered pair.

It would be helpful to show an overview. When passing the topic, it is necessary to draw students' attention to independently solve a system of two equations with two unknowns

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using the methods of substitution and addition, and acquire the skills to solve problems arising from such a system. When solving a system of two equations with two unknowns graphically, it is necessary to pay special attention to the cases where the system has infinitely many unique solutions and the cases where there are no solutions. If so, then the inequality of the form either has no solution, or the inequality holds for all values of except for the root of the triangle. For example, inequality is equivalent to inequality. Since the following inequality cannot be negative at any value, the inequality has no solution. let's see the inequality, this inequality is as strong as the inequality. Therefore, the inequality holds for all values except for . Consists of a field that satisfies the inequality. If so, to solve the inequality, divide the square triangle into multipliers and use the positive (negative) multiplier.

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