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The educational purpose of teaching mathematics

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Annotation: This article is about the educational goals and objectives of teaching mathematics and provides some general concepts.

Keywords: Elements of knowledge, mastering algorithms, methodological skills.

By solving problems in mathematics, along with the educational goals of teaching mathematics, its developmental and pedagogical goals are realized. The problem-solving learning process can be focused directly on the formation of students 'knowledge, skills and competencies as a factor of learning, or to control the level of knowledge, skills and competencies formed by the teacher or student. The first of these tasks falls into the category of instructional issues, the second into the category of control issues.

Teaching issues are mainly related to the formation of theoretical knowledge elements and related skills, and when we say theoretical knowledge, we emphasize the concepts and their definitions, theorems and proofs, rules and algorithms that are formed in the process of reading mathematics. Supervising issues are mainly recommended in independent and supervisory work, and these issues involve the application of acquired theoretical knowledge according to the content. The topics proposed in the independent and supervisory work are usually designed to apply students' knowledge in situations familiar to them, and mainly cover a small part of the study topics.

It should be noted that the issues aimed at the formation of rules and algorithms in students play an important role in the formation of skills and abilities of applied mathematics. In the process of solving such problems, students develop skills and abilities to calculate, to change the exact form of algebraic and transcendental expressions, to solve equations and inequalities and their systems. It is well known that in order to form skills and abilities, it is necessary to perform exercises that exactly repeat the rule or algorithm being studied. This necessitates a system of issues that provides a full mastery of the subject under study. So, we believe that creating a system of problems to master this or that rule or algorithm and learning on this basis is the main way to form skills and abilities in students.

We know that the features of the system of problems aimed at mastering the rules and algorithms are as follows:

- to give questions substantiating the need to study the rule (algorithm);
- the presentation of issues that activate the knowledge required to substantiate the rule and reflect the skills required to implement the rule;
- Assignment of problems for the performance of certain mathematical operations that are part of the rules;
- the presentation of issues intended to apply the rule in different contexts.

Relevant activities are directly related to the methods of solving certain types of problems, including:

1. Mathematical activities - are used in the activities of the interval method, which is used to solve inequalities in the application of the coordinate method in the direct or indirect proof of mathematical sentences, and others. Mathematical activities can be identified in the process of carrying out these activities, as well as depending on the content of the issues raised.
2. Learning activities - modeling the basic relationships of mathematical problems, identifying methods for studying certain types of mathematical problems, etc.

If undergraduate mathematicians begin to engage in independent learning, that is, if they are able to select meaningful means of posing educational problems and choose teaching aids to solve

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educational problems, self-assessment, and student assessment activities, then educational research activities will be formed.

Thus, the formation of teaching and learning skills of bachelor mathematicians in the study of mathematics is carried out in the process of mastering long-lasting mathematical knowledge based on the synthesis of mathematical and educational activities.

Hence, the method of solving certain types of mathematical problems is the interrelationship of learning and mathematical activities. As a result, undergraduate mathematicians gain methodological skills. However, methodological skills can also include general learning activities such as analysis and synthesis, generalization and identification, comparison and classification.

Accordingly, methodological skills can be divided into the following three stages:

1. The first stage of the formation of methodological skills leads to the understanding of the goals of this or that methodological or educational activities, the content of activities, often looking for ways to perform them as defined in the instructions or algorithms.

2. In some cases, it is necessary to transfer some of the formed methodological skills to a whole complex, ie to mathematical objects and enlarged blocks of study topics (mathematical methods, topics, types of mathematical problems, etc.). This is often done on the basis of an understanding of the purpose and through the use of general recommendations as well as general heuristics.

3. The above-mentioned methodological skill is realized not only when the goal is understood, but also with a complete definition of the methods, means and justifications of activities. A characteristic feature of this degree is that the various tools and methodological skills used are implemented in accordance with specific pedagogical situations. To develop these skills, it is necessary to provide both theoretical and practical training for undergraduate mathematicians.

As mentioned above, we prioritize problem solving and examples in hands-on activities as a key tool for undergraduate mathematicians to build their knowledge, skills, and competencies. Because by solving problems and examples, we achieve the educational goals of teaching mathematics. At the same time, we envisage the realization of developmental and educational goals.

As proof of our point, we solve the following textual problem.

Masala. The existing combine harvesters on the collective farm can work together and harvest in one day. According to the plan, one combine worked in the first hour, two in the second hour, three in the third hour, and so on. Only a few hours before the end of the harvest did all the combine harvesters work together. If all but five of the combine harvesters had been operating since the beginning of the harvest, the operating time under the plan would have been reduced to 6 hours. How many combine harvesters were there on the collective farm?

Solve. Have n combine harvesters on the collective farm, each of which can harvest 1 / x part of the crop in one hour. In that case, all combine harvesters can work together for one day and harvest all the crops. Therefore

$$\frac{24n}{x}=1 \qquad (1)$$

we form the equation.

In practice, in the first hour, one combine harvested 1 / x of the crop, in the second hour, two combine harvesters harvested 2 / x of the crop, and so on. n harvesters produced n / x part of the crop in n hours. Then for a few hours (assuming, m hours) all the combine harvesters worked,

$$\frac{1}{x}+\frac{2}{x}+\cdots+\frac{n}{x}+\frac{nm}{x}=1 \qquad (2)$$

harvesting the remaining nm / x of the crop in that m hour. Therefore

we form the equation.

The combine harvesters harvested the entire crop during the hour. If only one combine was working, then they would have harvested in an hour. Therefore

$$\frac{(n-5)(n+m-6)}{x}=1 \qquad (3)$$

we form the equation.

So we have the following three systems of three unknowns.

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$$\begin{cases} 24n = x, \\ \frac{1}{x} + \frac{2}{x} + \cdots + \frac{n}{x} + \frac{nm}{x} = 1, \\ (n-5)(n+m-6) = x. \end{cases} \quad (4)$$

(4) The system of equations is called a mathematical model of a given text problem. To solve this system, we use the formula for finding the sum of the terms of arithmetic progression to its second equation.

$$\begin{cases} 24n = x, \\ \frac{(n+1)n}{2} + nm = x, \\ (n-5)(n+m-6) = x. \end{cases} \quad (5)$$

appearance. Considering that it loses x from the system and, this

$$\begin{cases} m + \frac{n+1}{2} = 24 \\ (n-5)(n+m-6) = 24n \end{cases} \quad (6)$$

we create a system.

(6) As a result of losing m from the system, we come to the quadratic equation with respect to n in the view. Solve this equation, and find the roots. The number of harvesters from the collective farm should be because n. Accordingly, it only satisfies the condition of the matter.

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