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METHODOLOGY OF PERFORMING PRACTICAL INDEPENDENT WORK

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ABSTRACT
This article is devoted to the methodology of teaching independent work on the subject "Algebra and Number Theory". Some examples of independent work are given for 1-year students in the direction of the methodology of teaching mathematics. It describes the features of the methodology for performing examples in the subject “Algebra and Number Theory”.

Keywords: Algebra and number theory, sets, predicate, truth region, relation, didactic materials, independent work, numerical functions, properties, graphs, reflexivity, symmetry, transitivity of relations, learning, learning process, features of the methodology for performing examples.

THE SUMMARY
This article is about utilizing innovative technologies in teaching the subject of “Algebra and the theory of numbers”. It contains didactical materials about “Divisional relations in the circle of the whole numbers”. Also, several unconventional tests have been made related to the current theme. It informs us about the advantages and properties of using information technologies during the process of education, the kompyuter technologies.

Key word: Algebra and the theory of numbers, didactical materials, divisional relations, circle of the whole numbers, functions, numbers, advantages and properties of,programs, the process of education.

Along with lessons, independent works also play an important role in mastering a certain subject. It is necessary to pay attention to the following in organizing independent work and working with textbooks and training manuals.
First of all, it is necessary to start with the literature necessary for independent work. When working with mathematical literature, it is necessary to pay attention to the fact that all topics in it are connected with each other. Therefore, it is necessary to carefully study each concept, definition and theorems.
More attention should be paid to the better mastering of definitions, theorems, and formulas necessary for solving examples and problems.
Studying mathematical literature requires that you take a pen and paper and summarize the main definitions, theorems and formulas in them during the study of each topic. This makes it possible to solve examples and problems related to the studied materials, to master the materials thoroughly.
The goal of the student's independent work is to form and develop the knowledge and skills necessary for the student to independently perform certain educational tasks under the guidance and control of the teacher.
The tasks of the student's independent work are as follows:
- use of information sources:

- identifying convenient methods and means of searching for the necessary information;
- to acquire the skills of independent assimilation of new knowledge;
- to develop the skills of independent work with traditional educational and scientific literature;
- work with electronic educational literature and data bank;
- purposeful use of the Internet;
- being able to determine and analyze the rational solution of given assignments;

Taking into account the nature of the subject, the mastery level and ability of each student, the following forms are used to organize the student's independent work:

- independent mastering of some topics;
- report preparation;
- preparing for seminars and practical trainings;
- preparation for laboratory works;
- preparation of scientific articles, lecture abstracts for the conference;
- preparing theoretical knowledge for practice;

The form, content and scope of the student's independent work are expressed in the model and work programs for academic subjects.

The following topics can be given for independent learning.

considerations .

Truth values of the formula. Equivalent formulas. Laws of logic. Calculus of judgments, its system of axioms.

Rules of derivation. Deduction theorem.

Predicates and quantifiers.

Writing mathematical proofs in the language of predicates.

Practice exercises from the same topics are given below.

Example 1. M = { 1, 2, . . . , 20 } in the following set of predicates : _ _ _ _ _ _ _

A(x): "(x : 5)"; B (x): "x is an even number"; C (x): "x is a prime number"; D (x): "x times 3". A(x) ∧B (x) C ⇒(x) ∨D(x) Find the correct part of the prediction .

Solving. Write the predicate A (x) ∧B (x) true and the predicate C (x ∨) D (x) false of the set M a g a We will be able to identify a different el e m e ntl a yl a ntir a . _ _ _ According to the definition of the mathematical model , the correct part of the predicate is the set M and the set K _ _ _ _ _ _ _ _ _ _ _ _ Be the best in the game . _ _ _ _ _ _ _ _ _ Consider the set K : _ _

1) A(x) ∧B(x) pr e dic a tro o st mul o h a z a g a A simple set of values A (x) and B (x) is a single variable . _ a The elements of the universal set M , i.e. A 1 = { 5,10,15,20 } and B 1 = { 2,4,6,8 _ _ , 10,12,14,16,18,20 } is a part of the collection . _ _ _ _ _ This set is M 1 We have the following equation : M 1 = A 1 _ ∩B 1 = {10,20}.

2) C (x) ∨D (x) predicate C (x) and D (x) predicate are false _ _ _ _ The value of the set M will be false . _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ US 1 ={1,4,6,8,9,10,12,14,15,16,18,20} v a

D 1 = { 1,2,4,5,7,8,10,11,13,14,16,17,19,20 } _ _ _ _ _ _ _ _ _ _ t M 2 = { 1,4,8,10,14,16,20 } set . _ _

D e m a k, given that A (x) B ∧(x) ⇒C (x) ∨D(x) is the truth of the predicate M 1 ∩M 2 = { 10,20 } set . _ _ _

Example 2. M = {1, 2, . . . , 1 0} given in the set .

R={<x,y>| x, y ∈M ∧x = y -1} check the properties of the binary relation and draw its graph.

Solving. Let's check what properties the given binary relation obeys:

1) reflexivity property. $\forall(x \in M)$ (x = x-1) is false because, for example, $2 \neq 2 - 1$ for 2 elements of the set M. Hence, R- is not reflexive.

2) Antireflectivity property. $\forall(x \in M)$ $\neg$(x = x-1) is true. So, R- is antireflexive.

3) Symmetry property. $\forall(x,u \in M)$ (x = u -1 $\Rightarrow$u = x-1) is false. Because, for example, 3, 4 $\in$for M 3 = 4-1 $\Rightarrow$4 = 3-1 since the first statement is true and the second statement is false, the implication is false. So, R- is not symmetric.

4) Antisymmetry property. $\forall(x,u \in M)$ (x = u -1 $\wedge$u = x -1 $\Rightarrow$x = u) is true. Because, for any x, u elements of the set M, the statements x = u-1 and u = x-1 cannot be true at the same time. Hence their conjunction is false for the elements of the given set. Given that the implication of the first statement is false, it follows that R- is an antisymmetric binary relation.

5) Transitivity property.

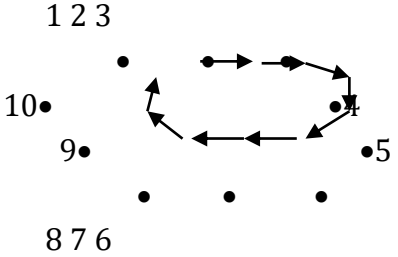
$\forall(x, u, z \in M)$ (x = u - 1 $\wedge$u = z - 1$\Rightarrow$ x = z - 1) false opinion. C h because, for example, for elements 3,4,5 of the set M

(3 = 4 -1) $\wedge$ (4 = 5 -1) $\Rightarrow$(3 = 5 -1) in implication, the conjunction is true, but the conclusion of the implication is a false proposition. By implication definition, (3 = 4 -1) $\wedge$ (4 = 5 -1) $\Rightarrow$(3 = 5 -1) statement is false. So R- is not transitive.

6) R- cannot be an equivalence relation because it does not have the properties of reflexivity, symmetry, and transitivity.

7) R cannot be an order relation, because R is antisymmetric and not transitive.

Now let's draw the graph of the given binary relation. For this, we set 10 points on the plane corresponding to the elements of the set M. They will be the vertices of the graph. For the elements in relation R , we connect the vertices of the graph representing them with directed sections - graph edges. Since no element of the set M has a self – self relationship R , we do not draw rings at the vertices of the graph. Since R is not a symmetric relation, the edges are oriented .



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