

**Department "Algebra and Mathematical Logic" for the first half of 2021
on scientific and organizational activities**

REPORT

The department carries out 5 works: 2 on the first topic and 3 on the second topic.

Topic 1. Application of methods of algebra and mathematical logic.

Topic 2. Research of Nasreddin Tusi's works on mathematics and logic.

In the first half of the year, the work in the department was carried out as planned.

The following work has been done on the first topic: Study of problems related to the study of Banach algebras, algebraic properties of continuous functions defined on compact sets or local compact sets, algebraic-spectral properties and characteristics of subalgebras (regular algebras): maximum ideals, functionality, endomorphism's, etc.

During the reporting period, in order to obtain the necessary information for research in this area, together with V. Mamedova, the following works were studied: A. Helemsky "Banach algebras", N. Bourbaki "Spectral theory", Khamelin "Equilibrium algebras", L. Gillman "Rings of continuous functions".

In the second half of the year, the results of the research will be presented in the form of a scientific article or dissertation.

The study of submaximal subgroups in a graded product of two-valued iterative Post algebras is considered. Considering each of the defined maximal subalgebras as an algebra, we re-examine the maximal subalgebras of these algebras and determine their total number, and define the submaximal subalgebra. During the reporting period, the study of maximal algebras in several algebras was completed. During the reporting period, temporal modalities were studied in the works "Tajrid al-mantig" by N. Tusi and "Isharat wat-tanbihat" by Ibn Sina. The classification of temporal modal judgments is studied: general absolute, impermanent existence, special absolute, descriptive, general habitual, general conditioning, temporal, temporary general absolute, issues of temporal dependence, their influence on the four figures of the syllogism are studied.

In addition, Nasreddin Tusi's Asasul Igtibas studies the modes of the first figure with various premises.

The research results will be presented in the second half of the year as a scientific article.

Scientific and organizational work.

On May 7, 2021, at the scientific and theoretical webinar "Mathematical and logical works of Nasreddin Tusi" at the Physics and Mathematics Faculty of Nakhchivan State University, the head of the department, Ali Babayev, made a plenary report.

Head of the department Ali Babaev and senior researcher Valeria Medzhumbekova at the International conference dedicated to the 130th anniversary of the birth of academician S.I. Vavilov on May 17-21, 2021 at the Institute of the

History of Natural Science and Technology of the Russian Academy of Sciences in Moscow "Innovation of Nasireddin Tusi in the development of mathematics. To the 820th Anniversary of the Scientist ”.

Works published during the reporting period:

1. А.А.Бабаев, В.Ф. Меджлумбекова. *Логические принципы в математических трудах Насиреддина Туси*. Второй Международный Конгресс Русского общества истории и философии науки «Наука как общественное благо», Том 4. Сборник научных статей. Санкт-Петербург, 2020. ст.72-75.
2. Eminağa Məmmədov, Rəna Babayeva. *Klassik məntiqdə modal təkliflər haqqında: Nəsirəddin Tusi və İbn Sina*. Elm Tarixi jurnalı, №1. Bakı, 2021. səh. 7-15.

In press of the article:

1. E.Məmmədov. *Riyazi induksiya metodu və onun tətbiqləri*, “Siqma” elmi-kütləvi jurnalı, 11 səh.
2. E. Məmmədov, Ə.Məlikov. *Neopozitivizmdə həqiq olmağın şərtləri və əsaslandırılmış doğru inam*. 9 səh.
3. Ə.Babayev, V.Məclumbəyova. *Novatorstvo Насиреддина Туси в развитии математики . К 820-летию ученого*. 4 səh.

In addition, the translation of the book "Discrete Mathematics" by I.A. Maltsev into Azerbaijani.

Leyla Sheikhzamanova and Ali Aliyev continue to work on the translation and editing of the Commentary on the Book of Archimedes "On the Sphere and the Cylinder" by N. Tusi from the Arabic language.

The head of the department, Ali Babayev, continues to work on the monograph "Works of Nasreddin Tusi in the field of mathematics and logic" in connection with the 820th anniversary of Nasreddin Tusi.

Head of department:

A.A.Babayev