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USING OF NEW PEDAGOGICAL TECHNOLOGIES IN TEACHING «ANALYTICAL GEOMETRY» SUBJECT

Saylieva G.R. Email: Saylieva696@scientifictext.ru

Saylieva Gulrukh Rustam kizi – Teacher,
DEPARTMENT OF MATHEMATICAL ANALYSIS, FACULTY OF PHYSICS AND MATHEMATICS,
BUKHARA STATE UNIVERSITY, BUKHARA, REPUBLIC OF UZBEKISTAN

Abstract: *the following article deals with the use of several modern, pedagogical technologies that can be used to explain the topic of hyperbola to students in the field of Analytical Geometry, which is taught in higher education. In the system of higher education, it is important for students to master the subject, to conduct independent research on this topic, to try to read and understand, and to be able to share their knowledge with others. In other words, it is not only the teacher who has to explain in the classroom, as well as students should actively be involved in the study of the topic.*
Keywords: *hyperbola, "Zig-zag" method, focal point, focal radius, asymptote, canonical equation.*

ИСПОЛЬЗОВАНИЕ НОВЫХ ПЕДАГОГИЧЕСКИХ ТЕХНОЛОГИЙ В ОБУЧЕНИИ ПРЕДМЕТУ «АНАЛИТИЧЕСКАЯ ГЕОМЕТРИЯ»

Сайлиева Г.Р.

Сайлиева Гулрух Рустам кизи – преподаватель,
кафедра математического анализа, физико-математический факультет,
Бухарский государственный университет, г. Бухара, Республика Узбекистан

Аннотация: *в этой статье обсуждается использование нескольких современных педагогических технологий, которые могут быть использованы для объяснения темы гиперболы студентам в области аналитической геометрии, преподаваемой в высших учебных заведениях. В системе высшего образования студентам важно овладеть предметом, проводить независимые исследования по этой теме, пытаться читать и понимать и иметь возможность делиться своими знаниями с другими. Другими словами, объяснять в классе должен не только учитель, а студенты должны активно участвовать в изучении темы.*
Ключевые слова: *гипербола, метод «зиг-заг», фокус, радиус фокусировки, асимптота, каноническое уравнение.*

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In the system of higher education the same approach is given to the explanation of the topics "General equation of the second order line", "Hyperbola", "Parabola", which make up the chapter "Elementary theory of second order lines" of the course of Analytical Geometry. In this case, the teacher should explain the topics of "General equations of the second order line" and "Ellipse" in full, and the main activity in explaining the topics of "Hyperbola", "Parabola" and during the lesson using various modern pedagogical technologies [1-14]. Below we have considered the Zigzag and Three Right, One Wrong methods that promote these ideas.

Method of «Zigzag». Students are divided into 7 groups and the groups are named. In groups, the text covering the essence of the new topic is divided into parts, and the task of getting acquainted with the content of the separated parts is assigned to the groups. Students study and narrate texts carefully. In order to save time, leaders are appointed from among the team members and they perform the assigned task. Leaders' opinions can be supplemented by group members. After students in all groups have told about the content of

the text, the texts are swapped between groups and the previous activity is repeated. Several texts are presented to the groups. In this way, after studying the content of all texts by groups, students identify the basic concepts of the topic, determine their logical relationship, and on the basis of the resulting ideas develop a scheme on the topic. Then, on the basis of the acquired knowledge, students are given the task to develop such schemes.

Steps of using «Zigzag» method:

1. Students are divided into 7 groups and are named based on the subject by the teacher;

1. The text of the new topic, which students are given the task of pre-study is divided into 7 parts, and the groups study the part of the topic and explain it to the audience. For example, when teaching the topic of hyperbola, we can divide the text of the topic into the following parts:

a) Group "Ellipse" - the canonical equation of the hyperbola;

b) Group "Focal radius" - the shape of the hyperbola;

c) Group "Asymptote" - the focal radii of the hyperbola;

d) Group "Hyperbola" - Symptoms of hyperbola;

e) Group "Quadratic function" - examples of finding the radius of a hyperbola;

f) Group "Determinant" - examples of the canonical equation of hyperbola

g) The "circle" group is a proof of the hyperbola theorem.

The teacher evaluates each group based on their approach to explaining the topic, their ability to explain, and their ability to cover new unspoken information. These groups should provide at least the following information on the part of the topic assigned to them:

a) In the canonical equation of a hyperbola - using the definition of a hyperbola, we take two points from the plane of the board, intersect them as the origin, and draw the axes passing through the two points and perpendicular to it. We point axes as, and students try to find the solution of canonic equation themselves. We get the following focus:

$F_2(-c;0)$ and $F_2(c;0)$

$$\left|\sqrt{(x+c)^2+y^2}-\sqrt{(x-c)^2+y^2}\right|=2a.$$

$$\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$$

It is names as canonical equation of hyperbola.

b) Form of hyperbola;

In this section, students do the same work on the board as above, creating a coordinate plane. Then they try to draw a graph of the equation of the hyperbola by marking several points that satisfy it. Of course, in this process, they use the domain of the equation and other information. Since the hyperbola equation holds for even levels of variables, the hyperbola has two axes of symmetry, which consist of coordinate axes. The axes of symmetry of a hyperbola are called its axes, and their point x and y intersection is called the centre of the hyperbola. The axis where the focus of the hyperbola is located is called its focal axis. In the asymptotes section of the hyperbola, students should provide information about the asymptotes of the hyperbola, their function, the equation. In the remaining sections, the same information should be given by the students to the audience.

After all the groups have explained the topic to the rest, the teacher draws a diagram on the board based on today's knowledge. The scheme clearly reflects the interrelated concepts of the topic. Through the above methods used during the lesson, students acquire the ability to fully express their opinions, explain, and prove their point, to evaluate other opinions and, most importantly, a solid knowledge of the topic. As a result of repeated study of the topic in 7 groups in 7 sections, one group can reveal what the other group overlooked. Its shortcomings are almost undetectable. We can use these methods effectively in teaching the exact and natural sciences.

We notice that in [15] the types of the fixed points are discussed and in [16-24] applying the elements of the analytic geometry intersecting points of the graph of the Fredholm determinan corresponding to the generalized Friedrichs model (as a function of z) and the line Ox.

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