Type of material: Lesson plan

Subject: Mathematics
Topic: The solution of exponential equations by equalizing indicators
Type of lesson: Development lesson

General competencies developed during the lesson:
Computational thinking
Digital study materials developed for the lesson:
https://quizizz.com/join/quiz/5cbc1bf91341ff001a9f3fe8/start
https://padlet.com/ekolegova7/q86riwom60nf
https://edu.glogster.com/edit/glog/?id=63653852

Objectives:
1. Student is able to apply basic formulas to calculate numerical expressions containing a degree;
2. Student is independently able to propose a hypothesis for creating an algorithm for solving exponential equations;
3. Student understands the need to test the hypothesis;
4. Student is able to formulate an algorithm for solving exponential equations by adjusting indicators;
5. Student is able to present the final product through the interactive board Padlet.

A. Introduction:

- Activating pre-knowledge.

The great Russian scientist M.V. Lomonosov said: "Let one delete the degree in math, and one will see that without it no one will go far."
Link: https://edu.glogster.com/edit/glog/?id=63653852

I suggest you to revise all the material which you know by doing this test about "Degree of number"
Link: https://edu.glogster.com/edit/glog/?id=63653852
(section I. Repeat the topic "Properties of degrees")

B. Independent research and practice:

- Complete the tasks.

Link: https://edu.glogster.com/edit/glog/?id=63653852
(section II. Complete the task)

- **Exponential equations. DEFINITION:**

An equation in which the variable appear in the exponent, is called an exponential equation. The exponential equation in the form of $y = a^x$, where "a" is positive real number and "x" is the real number is known as the exponential equation. Therefore:

- Using the properties and formulas of degrees, figure out how to solve exponential equations;

a) $3^x = 3^2$

b) $5^{3x+1} = 5^2$

c) $2^{8x-3} = 4$

- Create an algorithm for solving such equations;

➢ **Algorithm. DEFINITION:**

Algorithm – instruction, procedure for solving a problem.

Link: https://edu.glogster.com/edit/glog/?id=63653852
(section III. Add your algorithm and solved equations to the board Padlet .)

Add your algorithm and solved equations to the board Padlet .

C. Summarizing

Today, you did not just recall the properties of degrees; you managed to make a real discovery in class. You managed to figure out how to solve exponential equations by equalizing indicators.

D. For the teacher use:

Possible answers for the algorithm for solving exponential equations using equalization indicators

1. Present both parts of the exponential equation as a degree with the same base;

2. Take advantage of the property: if the bases of the degrees are equal, then their indicators are also equal;

3. Equate the exponents, and reject the grounds;

4. Solve the resulting equation;

5. Record the answer.

Example:

$5^x = 125$

$5^x = 5^3$

$x = 3$

Answer: 3