IMPROVING THE PRACTICAL TEACHING PROCESS THROUGH CASE-BASED SITUATIONS

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Annotation:*This article focuses on developing students' skills in independent thinking, problem analysis, and making optimal decisions during practical training sessions. The integration of case-based situations into the educational process is scientifically analyzed as a means of forming competencies such as analytical thinking, teamwork, decision-making, and the ability to apply theoretical knowledge in practical activities. As a result, the use of case situations is emphasized as a modern, interactive, and effective pedagogical approach for improving the practical teaching process.*

Keywords: case situation, practical training, mathematics.

Introduction. In higher education institutions, along with delivering lectures in mathematics, practical training sessions also play an important role. During practical classes, solving examples and problems serves to connect the theoretical knowledge covered in lectures with practical application and to form students' relevant skills related to the topic [1]. Therefore, it is necessary to introduce new approaches to organizing practical mathematics classes in higher education. One of the most important requirements for organizing practical classes in mathematics is that the selected topic for each session be scientifically grounded. This means that the objectives of the class should be determined based on students' capabilities, the scope and complexity of the topic should be identified, the newly presented theoretical material should be linked to previously studied topics, and the sequence of tasks and independent work to be assigned to students should be planned. In addition, the teaching process requires specifying the necessary equipment, enriching the session with supplementary visual aids, and creating a problem-based situation using modern teaching technologies. To achieve this, the mathematics

teaching process requires the application of advanced pedagogical technologies. Since advanced and non-standard (interactive) forms of instruction are among the ways to effectively organize educational and developmental tasks, they enhance students' cognitive activity and improve the quality of learning [2].

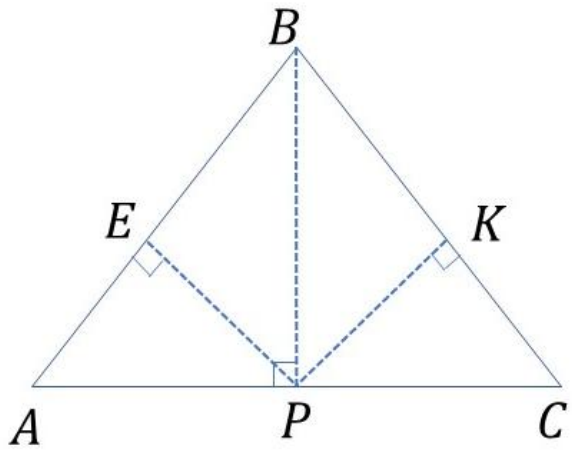
One of the advanced teaching technologies aimed at increasing the effectiveness of teaching mathematics is the Case-Study method. This technology is considered effective because it creates problem-based situations for students and directs them toward independent work and decision-making [3].

Therefore, when organizing mathematics classes using the Case-Study technology, it is necessary to present a problem-based task that encourages students to create and analyze an original work. The given assignment encourages students to gather information from relevant educational literature, mass media, and Internet sources beyond the classroom. This allows learners to visualize the situation and identify a set of problems. The provided learning materials may be presented in various formats: print, video, audio, or multimedia.

When giving assignments using these resources within the Case-Study technology, attention should be paid to the following: the research problem must be relevant, not have a clear or straightforward solution, correspond to the topic of the session, contain insufficient information for complete analysis, and include contradictory data. Additionally, it is necessary to consider the following aspects: defining the purpose of developing the case and forming communicative competence. To do this, one must create a scenario based on a familiar and well-known sequence of events, describing the communication details used in interpersonal interactions between the participants. Based on the recommendations mentioned above, we present an example of a case assignment suitable for use in practical training sessions.

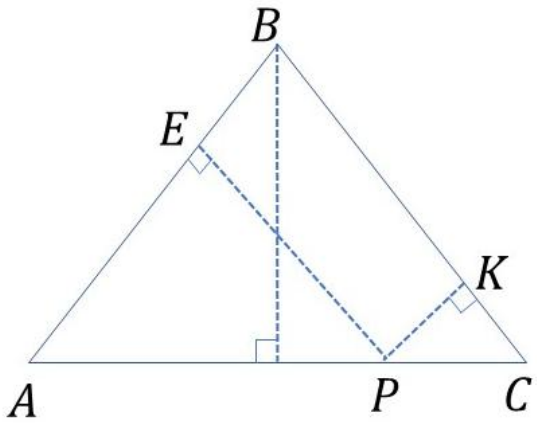
Assignment: *If an isosceles triangle has a base of 10 units and an altitude drawn to the base of 4 units, find the difference between the distances from a point on the base to the two equal sides of the triangle.*

Case 1: The point P is located at the midpoint of the base.



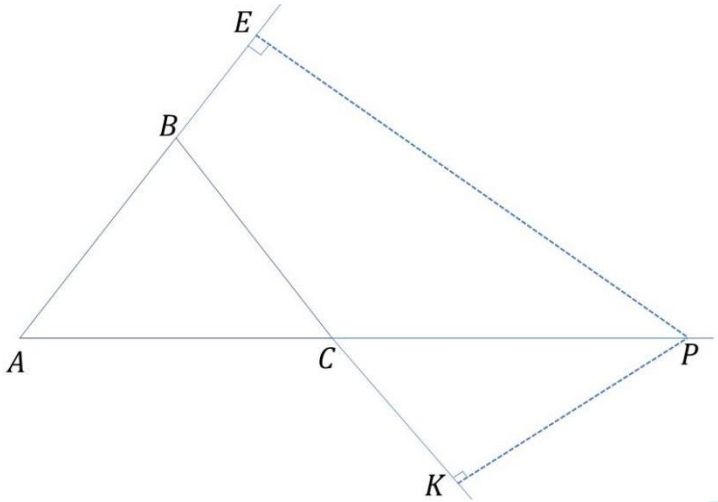
$$PE = PK$$
$$|PE - PK| = |h_2 - h_1| = 0.$$

Case 2: The point P is located at any position on the base other than the midpoint.



$$\lim_{P\to C}|PE - PK| = \lim_{P\to C}|h_2 - h_1| = \lim_{P\to C}|h - 0| = h.$$
$$\lim_{P\to A}|PE - PK| = \lim_{P\to A}|h_2 - h_1| = \lim_{P\to A}|0 - h| = h.$$

Case 3: The point P is located at the end of the base.



$\Delta ABC, AB = BC, \angle BCA = \angle BAC,$

$\Delta BDC \sim \Delta PCK, \angle BCD = \angle PCK,$

$\frac{PK}{BD} = \frac{PC}{BC} \Rightarrow PK = \frac{BD}{BC} \cdot PC.$

$\Delta BDC \sim \Delta AEP, \angle BCD = \angle EAP,$

$\frac{PE}{BD} = \frac{PA}{BC} \Rightarrow PE = \frac{BD}{BC} \cdot PA$

$$|PE - PK| = \left|\frac{BD}{BC} \cdot PC - \frac{BD}{BC} \cdot PA\right| = \frac{BD}{BC} \cdot AC = h.$$

Here, hhh is the altitude drawn to the side of the triangle.

$$AD^2 + BD^2 = AB^2, AB = \sqrt{41},\ S_{ABC} = \frac{1}{2} \cdot 4 \cdot 10 = \frac{1}{2} \cdot h \cdot AB \Rightarrow h = \frac{40}{\sqrt{41}}.$$

Conclusion: It has been established that practical teaching based on case situations is one of the effective methods for developing students' professional competencies in modern education. This approach enhances students' ability to apply theoretical knowledge in real-life situations, analyze problems, develop alternative solutions, and make appropriate decisions. The Case-Study method strengthens teamwork, communication skills, creative thinking, and analytical reasoning, activates the learning process, and increases student engagement during lessons.

References

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