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RESEARCH ARTICLE

SOLUTION OF PROBLEMS IN SEMINARS ON ORGANIZATION OF INDEPENDENT EDUCATIONAL ACTIVITY OF STUDENTS.

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Abstract

This article provides an opportunity to observe the students' independent work during the workshop sessions, assimilate them and evaluate their work with additional literature. Interviews will be held before the workshop. The teacher will provide insights into this type of training and the requirements for preparation. Seminar sessions are an active form of students' independent work. It is in these sessions that a full implementation of the "student-teacher" interconnectedness is achieved, whereby students can consciously grasp the material they are learning and answer unnecessary questions. In a number of cases, there is class discussion, where students argue and persuade other students to come up with ideas. All of this expands the knowledge of students. During the seminar class, students' interest in learning will increase. Particularly during the workshop sessions, problematic issues give rise to new innovative ideas, with the use of graphic experimental issues and increased students' interest in physics.

Introduction:-

Seminar sessions are an active form of students' independent work. It is in these sessions that a full implementation of the "student-teacher" interconnectedness is achieved, whereby students can consciously grasp the material they are learning and answer unnecessary questions. In a number of cases, there is class discussion, where students argue and persuade others to put forward ideas. All of this expands the knowledge of students.

During the workshop, students will have the opportunity to observe the independent work of students, to assess their performance and work with additional literature. Interviews will be held before the workshop. The teacher will provide insights into this type of training and the requirements for preparation.

The issue of introducing a holistic lecture-seminar system for students' teaching is adequately covered in the scientific and methodological literature. NP Guzik skillfully combines lecture and seminar methods with other teaching methods. His work system includes the following five types of lessons:

1. Lecture notes.
2. Combined seminars with individual work on student learning materials.
3. Lessons on summarizing and systematizing knowledge, which are conducted in the form of tests on previously studied topics.
4. Courses on interdisciplinary synthesis of materials.
5. Practical lessons.

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Such a working system allows the bulk of the reading to take place in the classroom, with the exception of traditional reproduction homework and replaced with creative independent work. This system activates the process of working independently in the classroom for all students, helping them to develop as much mental as possible.
Such methods of work help children to cooperate in the learning process. Students are given a special amount of time to repeat the subject matter several times in a variety of ways and in different ways. All of this will help students to fully and thoroughly master the learning material.

Physical experience and problematic issues play an important role in consolidating the students' theoretical knowledge, forming environmental beliefs, correct attitude to work and directing them to scientific research. Physical practices used in physical education practice are of two types:

1. Demonstrated experiences. They are mostly done by the teacher.
2. Learning practices (laboratory experiments), practical exercises, practice, solving experimental tasks are carried out by students themselves.

Demonstration experiments are conducted primarily because students are not familiar with the topics and events that are being studied in advance and are not ready to watch. In this case, the teacher not only demonstrates the subject to be studied, but also organizes the observation.

Student learning experiences are a form of independent work. The independent work of the students consists of laboratory experiments, practical exercises and solution of experimental tasks, which are carried out in whole or in groups, aimed at studying, researching and reinforcing the new topic. We recommend the following experimental procedure.

The lens is moving between the screen and the screen. What is the size of the item?

Provided Solutions
h1 = h2 Since the lens has not been altered, its focus distance is the same in both cases.
F=const;
f1+d1=f2+d2 $\frac{1}{F}=\frac{1}{f_1}+\frac{1}{d_1}$ $\frac{1}{F}=\frac{1}{f_2}+\frac{1}{d_2}$ $\frac{1}{F}=\frac{1}{F}$
h=? $\frac{1}{f_1}+\frac{1}{d_1}=\frac{1}{f_2}+\frac{1}{d_2}$: (1)
In this case, the distance between the object and the screen is the same as f_2 + d_1 = f_2 + d_2; (2)

In the first case, the magnification of the lens in the second case;
$K_1=\frac{f_1}{d_1}=\frac{h}{h_1}=> f_1\frac{h_1d_1}{h}$ $K_2=\frac{f_2}{d_2}=\frac{h}{h_2}=> f_2\frac{h_2d_2}{h}$
The value of f1vaf2 is given by the formula (1) and (2), where we find h.
(1)$\frac{1}{\frac{h_1d_1}{h}}+\frac{1}{d_1}=\frac{1}{\frac{h_2d_2}{h}}+\frac{1}{d_2}$ (2) $\frac{h_1d_1}{h}+d_1=\frac{h_2d_2}{h}+d_2$
$\left(\frac{h}{h_1}+1\right)\frac{1}{d_1}=(\frac{h}{h_2}+1)\frac{1}{d_2}$ h1d1+hd1=h2d2+hd2
d1(h1+h)=d2(h2+h)
$\frac{d_1}{d_2}=\frac{\frac{h}{h_1}+1}{\frac{h}{h_2}}=\frac{(h+h_{1)}h_2}{(h+h_{2)}h_1}$ $\frac{d_1}{d_2}=\frac{h_2+h}{h_1+h}$
$\frac{d_1}{d_2}=\frac{d_1}{d_2}=>\frac{(h+h_1)h_2}{(h+h_2)h_1}=\frac{(h+h_2)}{(h+h_1)}$
(h+h1)2h1=(h+h1)2h2
(h2+2hh2+h22)h1=(h2=2hh1+h12)h2
h2h1+2hh2h1+h22h1=h2h2+2hh2h1+h12h2
h2h1-h2h2=h1h2-h22h1
h2(h1-h2)=h1h2(h1-h2)
h2=h1*h2
h=$\sqrt{h_1*h_2}$Javob: $\sqrt{h_1*h_2}$

Since the lens has not been altered, its focus distance is the same in both cases.

Problem 2 Determine the acceleration of the loads and the tension of the threads as illustrated in the figure. Slope of inclined plane, masses of loads,,. Do not consider friction.

Issued by: $m_1 = 4kg$, $m_2 = 2kg$, $m_3 = 8kg$, $\alpha = 30^0$.

To find: $a = ?$, $T_1 = ?$, $T_2 = ?$

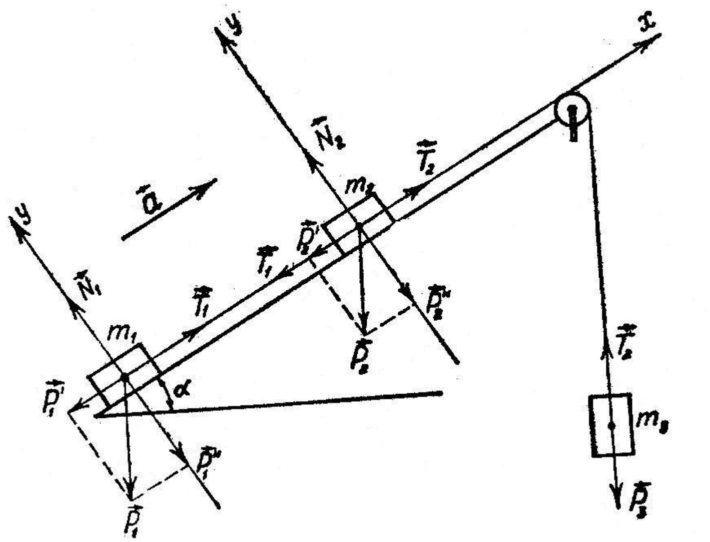


Figure 1:-We list the forces acting on each body. The body is affected by three forces: m_1 -The force of gravity, $\vec{P}_1$ -The tension force of the body, $\vec{T}$ -Raxial force of the plane of the plane. m_2 The four forces on the body: $\vec{N}_1$ - the force of gravity, $\vec{P}_2$ - the force of gravity, and $\vec{N}_2$ - the force of tension. $\vec{T}_2$ two forces on the body: m_3 - the force of gravity $\vec{P}_3$ and $\vec{T}_2$ - the force of tension.

Let us assume that the acceleration is upward along Let x be the coordinate axis in the acceleration direction, and the y-axis is perpendicular to it (see Figure 1). Then, and for these power projections:

$$P'_1 = P\sin\alpha; \qquad P'_2 = P_2\sin\alpha;$$

$$P''_2 = P_2\cos\alpha; \qquad P''_2 = P_2\cos\alpha$$

for example, we write the equation of motion for each body:

$$\begin{cases} T_1 - P'_1 = ma, \qquad T_1 - P_1\sin\alpha = m_1 a, \\ T_2 - T_1 - P'_2 = m_2 a, \qquad T_2 - T_1 - P_2\sin\alpha = m_2 a, \\ P_3 - T_2 = m_3 a, \qquad P_3 - T_2 = m_3 a. \end{cases}$$

Adding these equations together gives us the following:

$-P_1\sin\alpha - P_2\sin\alpha + P_3 = a(m_1 + m_2 + m_3)$, from

$$a = \frac{m_3 g - m_1 g\sin\alpha - m_2 g\sin\alpha}{m_1 + m_2 + m_3} = 3{,}5 m/c^2.$$

In the first equation we find T1:

$$T_1 = P_1\sin\alpha + m_1 a = mg\sin\alpha + m_1 a = m_1(g\sin\alpha + a) = 33{,}6N.$$

We find T2 in the third equation:

$$T_2 = P_3 - m_3 a = m_3 g - m_3 a = m_3 (g - a) = 50{,}4N.$$

Answers: $T_2 = 50{,}4N,$

$T_1 = 33{,}6N,$

$a = 3{,}5 m/s^2.$

The students are not interested in such problematic issues. Other students want to solve the issue in such a sequence. During the workshop lesson, students will gain knowledge. This will be especially interesting and meaningful since the issue is presented in practice. Also, graphic issues are important in the workshop sessions, and we recommend the following.

Graphical problems are the questions that the object of study consists of linkage graphs of physical sizes.

In some cases, these graphs are presented in the context of the problem, and in some cases, they need to be summarized.

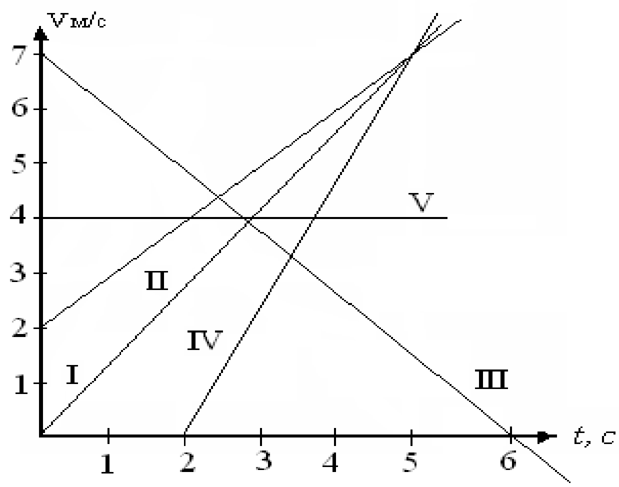
When solving graphic problems:
1. Students should be given the skills to "read" graphs and to make simple graphs.
2. It is increasingly difficult to work with graphs and encourage students to find quantitative links between sizes, until they form equations.

The stages for solving graphic issues are:
1) If the graph of the links between the sizes is given, it is necessary to explain it, to study the nature of the links in each section; 2) use the scale to find the values (values of the abscess and ordinate axis) on the graph; 3) If no link graph is provided, a graph is generated based on the values obtained from specific tables or case conditions.
To do this, draw the coordinate arrows, select a specific scale, draw tables, and then make points corresponding to the plane ordinances and abscisses with the coordinate arrows. By combining these points, a graph of the relationship between physical quantities is drawn, and then studied in the order described above.
As an example, we will see the following issue.

Using the graph in Figure 2, describe how the objects moved and write the velocity formula for each movement.
Students independently analyze the movement by looking at the graph.

Analyze each look of the chart separately.

The actions in the graph are analyzed by students as follows:
1. If the velocity increases over time, then the movement is accelerated.
2. Slow down as time goes by.
3. If the velocity remains constant, there is a smooth motion.
4. The acceleration is determined for the alternating motion. $a = \frac{\Delta \vartheta}{\Delta t}$
5. For a smooth variable motion, the velocity formula is written from the acceleration formula. $\vartheta = \vartheta_0 + a \cdot t$
6. From the graph are fixed constant values: From the velocity axis and by the calculation can be found. $a = \frac{\Delta \vartheta}{\Delta t} = \frac{\vartheta_2 - \vartheta_1}{t_2 - t_1}$
7. ϑ_0 and a the total value will be added.



To arrive at a conclusion based on student responses, the teacher analyzes the graphs based on the students' theoretical knowledge and analyzes their own thinking.

In graph I, the flat acceleration is zero with the initial velocity zero. II is a straight-line motion with an initial velocity of 2 m / s. III is a straight-sliding motion with a starting velocity of 7m / s. IV is a special case of flat acceleration with zero initial velocity. V is a straight line with a velocity y = 4 m / s. According to the above conclusions, the equations are written by placing the values of acceleration in the formula of velocity:

I $\vartheta_0 = 0$; $a = \frac{7м/c}{5c} = 1{,}4 м/c^2$; $\vartheta = 1{,}4t$

II $\vartheta_0 = 2м/c$; $a = \frac{7м/c - 2м/c}{5c} = 1м/c^2$; $\vartheta = 2 + t$

III $\vartheta_0 = 7м/c$; $a = \frac{0м/c - 7м/c}{6c} = 1{,}2м/c^2$; $\vartheta = -7 + 1{,}2t$

IV $\vartheta_0 = 0$; $a = \frac{7м/c}{5c - 2c} = 2{,}33м/c^2$ υ= 2,33(t2-2)

V $\vartheta_0 = 3м/c$; a =0 straight action. It can be regarded as a private case of a flat-variable movement with acceleration of 0.

$\vartheta = \vartheta_0 + 0 \cdot t = \vartheta_0$ will be analyzed. Through these considerations, the graphic matter is considered to be fully processed.

Pupils independently solve problems: - strengthens theoretical knowledge; - Creates and develops the ability to think independently; - Examines the links between physical dimensions; - achieves conscious development of the laws of physics; - the ability to make graphs, depending on the situation; - learns to record physical data according to the charts.

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