THE IMPORTANCE OF PRACTICAL TRAINING IN THE TEACHING OF THE" ELECTROMAGNETISM " DEPARTMENT

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Abstract
This article presents the important importance of problem solving in the study of physics. The teacher is introduced to the most important general methods and methods of solving issues, which form the physical thinking of the learners, give them relevant practical training and qualifications, save time. The electromagnetism section's " electric charges. Coulomb's law. Some issues related to the topic" electric field voltage " are divided into classifications and their solutions are presented.

Keywords: physics, methodology, thinking, competence, method, method, electromagnetism, charge, Coulomb's law, electric field amplification, classification, quality issues, computational issues, expert issues, graphic issues.

Introduction

Solving issues is important in the study of physics. Mastering the course of physics without solving problems in physics is considered complex. For this reason, in almost all educational masakans, great importance is attached to solving issues. Nevertheless, most students and students always have difficulty solving issues. This is due not only to the main reason for the complexity of practical classes in this variety for students, but also to the fact that there is a drawback in the methodology for choosing and solving issues in the course of physics.

Most teachers act on the principle that the more issues and particularly difficult are dealt with, the better. But it weighs on the learners, which results in them becoming distrustful of their powers without being able to cope with the issues given, and their interest in the discipline begins to fade away. As a result, the concept that studying the course of physics is complex is absorbed in them. Therefore, we need teachers to develop easy ways of problem solving methodology for learners. This article introduces the teacher to the most important general methods and techniques for solving issues that shape the physical thinking of learners, give them relevant practical training and qualifications, save their time. This involves the classification of issues in the physics of methods and techniques into classifications. Active thinking with a specific goal is a solution to the issue. From the methodological and educational literature, the study of physical phenomena selected for a specific purpose, the formation of concepts, exercises aimed at developing the physical thinking of students and being able to apply the knowledge gained to them is considered an issue. There are many other goals for solving problems, such as educating students, taking into account their knowledge, determining their training and qualifications, etc.

Issues in physics can be classified according to many signs, such as their content, for what purpose they are given, to what extent an issue is applied, the methods of solving, the degree of difficulty and other signs. These classifications include quality issues, computational issues, expert issues, and graphic issues. Depending on the content of the issues, we can divide them into sections of physics. There may be issues related to mechanics, molecular physics, electromagetism, etc.

For example, in the section on electromagnetism “electric charges. Coulomb's law. Let's get acquainted with the solution of some issues related to the topic” electric field voltage", divided into classifications.

A matter of quality.

If the distance between the charges is reduced by 3 times, how does the force of interaction between them change?

Answer: increases 9 times.

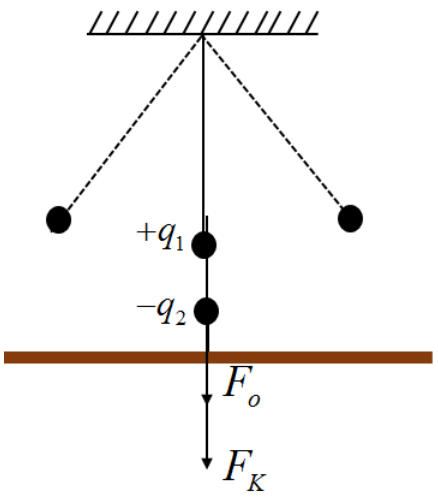
Given:	**Solution:**
$r_2 = \frac{1}{3} r_1$ $q_1 = q_1^{'}$ $q_2 = q_2^{'}$ $\frac{F_2}{F_1} = ?$	The force of action between charges is the Coulomb force $F = k\frac{q_1 \cdot q_2}{\varepsilon r^2}$ we write this formula for both cases, considering that it is equivalent to: $F_1 = k\frac{q_1 \cdot q_2}{\varepsilon r_1^2}$ (1); $F_2 = k\frac{q_1^{'} \cdot q_2^{'}}{\varepsilon r_2^2}$ (2) When we take the ratio of formulas 1 and 2 to find out how the force of interaction between charges has changed $\frac{F_2}{F_1} = \frac{k\frac{q_1 \cdot q_2}{\varepsilon r_2^2}}{k\frac{q_1^{'} \cdot q_2^{'}}{\varepsilon r_1^2}} = \frac{r_1^2}{r_2^2}$; $\frac{F_2}{F_1} = \frac{r_1^2}{r_2^2}$ (3) a working formula is formed. From Formula 3 we can find the interaction force between charges: $\frac{F_2}{F_1} = \frac{r_1^2}{r_2^2} = \frac{r_1^2}{\left(\frac{1}{3} r_1\right)^2} = \frac{1}{\frac{1}{9}} = 9$ $F_2 = 9F_1$

Eksperemental matter.

The pendulum is made up of a metal ball suspended in a weightless, non-stretchable and Vine-proof thread. How will the period of oscillation of the pendulum change if the balloon is positively charged and the negatively charged second balloon is placed so that it lies in one vertical line with a thread under the first balloon?

Answer: the vibration period is reduced.

Given:	**Solution:**
Maiatnik Positively charged sphere Negatively charged sphere $T = ?$	The painting depicts the forces acting on a positive sphere. That is, the weight force of the positive sphere and the Coulomb force are affected after the negatively charged sphere is placed under it so that it lies in one vertical line. The force acting on the positive sphere increases due to the attraction of two different signal charges. $F_n = F_o + F_K$ The acceleration that these forces give also increases accordingly. As we know, the period of oscillation of the mayatnink changes with a change in the acceleration of the flywheel. That: $T = 2\pi\sqrt{\frac{l}{a}}$ (1) The Formula 1 shows that the pendulum's oscillation period is inversely proportional to the acceleration received by the sphere.



$$T = \frac{1}{\sqrt{a}} \quad (2)$$

So, due to the increase in the acceleration that the forces are giving, the crankcase period is reduced.

A matter of calculation.

If the radius of the electron orbit is $0,5 \cdot 10^{-10} m$ if, by what force does the nucleus of the hydrogen atom attract an electron?

Answer: $F = 9,2 \cdot 10^{-6} N$

Given:	**Solution:**
$q_{elektron} = -1,6 \cdot 10^{-19} Cl$ $q_{praton} = 1,6 \cdot 10^{-19} Cl$ $r = 0,5 \cdot 10^{-10} m$ $\varepsilon_{havo} = 1$ $\varepsilon_0 = 8,85 \cdot 10^{-12} \frac{Cl^2}{N \cdot m^2}$ $F = ?$	Electron-proton interaction force $F = \frac{1}{4\pi\varepsilon_0} \cdot \frac{q_{elektron} \cdot q_{praton}}{\varepsilon_{havo} \cdot r^2}$ determined by the formula. $F = \frac{1,6 \cdot 10^{-19} Cl \cdot 1,6 \cdot 10^{-19} Cl}{4 \cdot 3,14 \cdot 8,85 \cdot 10^{-12} \frac{Cl^2}{N \cdot m^2} \cdot 1 \cdot \left(0,5 \cdot 10^{-10} m\right)^2} = 0,092 \cdot 10^{-6} N$ **Answer:** $F = 9,2 \cdot 10^{-6} N$

Graphic issue.

$q = 1 \cdot 10^{-9} Cl$ draw a graph of the connection to the distance of the voltage amount of the electric field of the point charge. In this, draw the value of the distance with an interval in the interval.

Answer: Graphic E and r drawn on coordinate axes. $\varepsilon_{havo} = 1$ when $E = \frac{q}{4\pi\varepsilon_0\varepsilon_{havo}r^2}$ (1) using the formula, for different values of, a table of E values is made. As we know, $k = \frac{1}{4\pi\varepsilon_0} = 9 \cdot 10^9 \frac{N \cdot m^2}{Cl^2}$ since is equal to and $q = 1 \cdot 10^{-9} Cl$ to make it easier to calculate the Formula 1 from the equality of the mumin we write as: $E \approx \frac{9 \cdot 10^9 \frac{N \cdot m^2}{Cl^2} \cdot 1 \cdot 10^{-9} Cl}{1 \cdot r^2} \approx 9 \frac{N \cdot m^2}{Cl} \cdot \frac{1}{r^2}$

for a point charge" q", the table of values of" E " will look like this:

$r(m)$	0,02	0,04	0,06	0,08	0,1
$E\left(k\frac{N}{Cl}\right)$	22,5	5,63	2,5	1,4	0,9

On the chosen scale coordinate axes, the values of" E "and" r " are placed and points corresponding to them are made. By combining points, a graph is generated. The result is a graph of the dependence of the point charge on the electric field voltage "E" and distance. The educational importance of solving issues is also great. With the help of issues, readers can also be introduced to the discoveries of scientists from our homeland with the emergence of new progressive ideas and worldviews. Issues also serve as a great means of upbringing in students in the upbringing of hard work, courage, willpower and character.

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