

An Application of Graphing Calculators in the Physics Studying Process

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Nowadays, in many countries graphing calculators have become one of the main tools for implementation of information technologies in diverse studying processes and, moreover, in the general education system. Modern graphing calculators are equipped with a rather complicated and multi-functional structure. The main menu of such a calculator is a vast table carrying the corresponding icons. For example, in the process of solving various physical problems, besides the standard mode of purely mathematical calculations, the following other modes are available in all graphing calculators: table mode, graph mode, dynamics graph mode, statistics mode, equation mode, and so on. All these allow one to get not only the result of calculations, but also to see the behavior of solutions.

As is well known, the process of solving physical problems is based on elaborated mathematical methods, with the aid of which it becomes possible to compare, generalize, analyze and make conclusions about a physical process. Students should be familiar with such methods and should know basic physical laws. Among problems of this type, quite often there are those tasks which are connected with a series of complicated calculations. The work in physical laboratories is also organically connected with more or less hard calculations and with errors implied by them, which should be evaluated. Furthermore, if intermediate calculations are necessary, then the total number of calculations substantially increases. On the other hand, the use of graphing calculators enables students to more efficiently obtain the result of an experiment and to interpret it in a reasonable way. Actually, such an approach leads to a qualitative analysis of the result.

Summarizing, one can state that a systematic usage of graphing calculators in the physics studying process, along with visualization allows students to analyze various physical problems (by varying initial conditions and parameters in the task). By using graphing calculators, students vividly see interconnections between the studying process and practice, and this circumstance helps them to learn more deeply physical and mathematical disciplines.