Applying graphs of functions of a single variable in solving equations and inequalities

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In Serbia teaching mathematics in elementary and secondary schools is predominately based on solving problems in all the mathematical branches. The traditional models of teaching usually consist of introducing the new math terminology, defining the introduced terms, describing the charasteristics of the defined terms, and, finally, solving the problems. The focus in teaching mathematics is on the problem itself and the procedure of solving it. The commonly used terminology is: Solve the equation, or Solve the inequality. The goal is achieved when, by applying the right solving procedure, you come to the correct solution of the problem.

In mathematics workbooks there are a lot of problems with good solutions. However, we are aware that in other countries different approaches are applied in schools, and their experience is different from ours. In Austria and some other countries, mathematics handbooks are used instead of math textbooks and workbooks. Their materials for young learners are full of complex problems ranging from calculating the perimeter and area of various figures to applying trigonometry for the purpose of the orientation at the open sea. During the process of solving the problems students have to apply most of their already acquired knowledge in these areas. It is accepted that the process of solving problemsis only one phase of the whole procedure, but not the goal. The analysis of the methods of the solving process, as well as the analysis of the kinds and types of the solutions have to be considered as the important parts, phases of the procedure. These analyses have a great influence on developing the studentscritical thinking and creativity which are considered important characteristics of teaching and learning.

The acquried knowledge and skills of drawing various categories of a single variable funcion: linear, quadratic, exponential, logarithmic, trigonometric etc. can be used for efficient and successful solving the problems related to the determination of the types and number of the solutions of the equations and inequalities. This approach is superior to the traditional algebric one because it enables us to visualise the process. Also, the determination of different types of functions enables the analysis of the types

and number of solutions. In the traditional algebric approach the analysis is done after reaching the solution of the problem. This new approach can enable our students to use their acquired competences in different mathematical areas, and transfer them into functional competences in solving various math problems.

This paper contains a lot of examples which will illustrate the fact that the new approach can be successfully applied in solving some difficult problems.