

CADGME 2010 key note:

Classical vs. Computer Approach in Proving Theorems

Pavel Pech, Faculty of Education, University of South Bohemia, Czech Republic

Proofs of mathematics theorems form the most difficult part of mathematics. For this reason proofs are often omitted at most of schools. But without proofs there is no mathematics. Despite this proving or at least verification of statements should be done in teaching mathematics of all school categories. It seems that new technologies CAS and DGS could help remedy this state. In the last 4 decades new methods of proving, deriving and discovering theorems by computers were invented. At the same time various dynamic geometry software was developed.

In the presentation I will show basic methods of proving, deriving and discovering of some well known statements by computer. By this we will use both DGS to describe and verify a problem, and CAS to make a rigorous proof. On many examples the theory of automated theorem proving is demonstrated. This new approach of proving theorems is compared with traditional methods. Strengths and weaknesses of both – classical and computer – methods are shown. Students seminar works and most common mistakes are presented.