

"TI-Nspire CAS"-implementation of the VAS real root isolation algorithm.

By Alkis Akritas and Spyros Kehagias

Usually, Sturm's bisection method (of 1827) is the only one presented to students for the isolation of the real roots of polynomials. And in most freely available computer algebra systems, Sturm's is the only algorithm they have available for use.

In order to change the trend and facilitate discussion on Vincent's theorem (of 1836) we present a library of programs, in TI-Nspire CAS, implementing the Vincent-Akritas-Strzebonski (VAS) continued fractions method within the allowed numerical accuracy (no gmp available in TI-Nspire CAS). Our implementation can handle multiple roots, i.e. we have incorporated square free factorization in our library.

Astonishingly, a large part of the library deals with separating the intervals of the roots of the square free factors of the original polynomial.