Using symbolic computation in Mathematica for verifying the convergence of the iterative methods

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ABSTRACT.

In [Jisheng Kou, *The improvements of modified Newton's method*, Appl. Math. Comput., **189** (2007) 602–609], the improvements of some third-order modifications of Newton's method for solving nonlinear equations are presented. In this paper we point out some flaws in the results of Jisheng Kou and we correct them by using symbolic computation in Mathematica. In [M. A. Noor et al., *A new modified Halley method without second derivatives for nonlinear equations*, Appl. Math. Comput., **189** (2007) 1268–1273] , the error equation obtained for the new method presented is wrong. We present the correct result by using symbolic computation, too. Finally, we present two examples of very simply proofs for the convergence of iterative methods by using symbolic computation. We consider that the Mathematica programs in this paper are good examples for other authors to prove the convergence of the iterative methods or to verify their results.

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