

MODIFIED NEWTON'S METHOD WITH THIRD-ORDER CONVERGENCE AND MULTIPLE ROOTS

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ABSTRACT. In recent papers a new modification of the Newton's method (mNm) which produces iterative methods with order of convergence three have been proposed. Here we study the order of convergence of such methods when we have multiple roots. We prove that the order of convergence of the mNm go down to one but, when the multiplicity p is known, it may be raised up to two by using two different types of correction. When p is unknown we show that the two most efficient methods in the family of the mNm converge faster than the classical Newton's method.