

**COMPARATIVE STUDY OF ONE-POINT OPTIMAL FAMILY
TO FIND MULTIPLE ROOTS**

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ABSTRACT

A multiple root is a root with multiplicity, also called a multiple point or repeated root. This topic has become a hot conversation to be studied by the researchers. Based on the previous article, they have developed new methods to find multiple root functions which are by using one-point optimal family second-order based on the weight procedure. It is a term that can refer to a family of iterative functions used to approximate the multiple zeros of nonlinear equations. However, in their study, four functions are used by them to check the efficiency of the method. Therefore, by using Maple 2016, the efficiency of three methods which are modified Newton's method, and other two methods that proposed by them which are Method 5 and Method 6 can be found. The variables that will be used are six different functions and three different initial guesses for each function. Lastly, the method with the lowest iteration and lowest error will be declared as the best method to find multiple root functions. The result showed that not all multiple root functions can be solved by using all three methods. However, the most efficient methods to find multiple roots are by using modified Newton's method and Method 5 if and only if its initial guess are close to the exact roots.

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