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Kanwar, V.; Sharma, Kapil K.; Behl, Ramandeep

A new family of Schröder's method and its variants based on power means for multiple roots of nonlinear equations.

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Summary: In this article, we derive one-parameter family of Schröder's method based on *K. C. Gupta* et al.'s [Int. J. Math. Educ. Sci. Technol. 40, No. 4, 571–575 (2009; Zbl 1294.97017; ME 2009d.00536)] family of ellipse methods for the solution of nonlinear equations. Further, we introduce new families of Schröder-type methods for multiple roots with cubic convergence. Proposed families are derived from modified Newton's method for multiple roots and one-parameter family of Schröder's method. Numerical examples are also provided to show that these new methods are competitive to other known methods for multiple roots.

Classification: N35 N45

Keywords: nonlinear equations; root-finding; Newton's method; Schröder's method; ellipse method; multiple roots; Newton-type methods

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