On modified interval repeated zoro symmetric single-step IRZSS1-5D procedure for bounding polynomial zeros simultaneously

ABSTRACT

We present a new rapidly convergence procedure called the interval repeated zoro symmetric single-step IRZSS1-5D which is an extension of the procedures IZSS1-5D and IRSS1. Theoretical analysis shows that the rate of convergence of IRZSS1-5D is at least 3r + 2 (r Ó 1), whereas the rates of convergence of IZSS1-5D and IRSS1 are at least five and 2r + 1 (r Ó 1), respectively. With r = 1, the procedure IRZSS1-5D is identical to IZSS1-5D. The procedures IRSS1 and IZSS1-5D are the basic references for the establishment of IRZSS1-5D, where the forward-backward-forward (FBF) step of IZSS1-5D are repeated r times in IRZSS1-5D, so that some elements of FBF of IZSS1-5D can be saved and reused for the next inner iterations r = 2,3, é in IRZSS1-5D.

Keyword: Point procedure; R-order of convergence; Simple zeros; Simultaneous inclusion