Determining radius of convergence of Newton's method using radius of curvature

ABSTRACT

In this paper, we propose a method on how to manage the convergence of Newton's method if its iteration process encounters a local extremum. This idea establishes the osculating circle at a local extremum. It then uses the radius of the osculating circle also known as the radius of the curvature as an additional number of the local extremum. It then takes that additional number and combines it with the local extremum. This is then used as an initial guess in finding a root near to that local extremum. This paper will provide several examples which demonstrate that our idea is successful and they perform to fulfill the aim of this paper.