Hindawi Publishing Corporation
Abstract and Applied Analysis
Volume 2013, Article ID 232618, 2 pages
http://dx.doi.org/10.1155/2013/232618

Letter to the Editor

Comment on "A Note on Kang-Rafiq-Kwun Iteration Method for Solving Nonlinear Equations"

Shin Min Kang,[1] Arif Rafiq,[2] and Young Chel Kwun[3]

[1] *Department of Mathematics and RINS, Gyeongsang National University, Jinju 660-701, Republic of Korea*
[2] *Department of Mathematics, Lahore Leads University, Lahore 54810, Pakistan*
[3] *Department of Mathematics, Dong-A University, Busan 614-714, Republic of Korea*

Correspondence should be addressed to Arif Rafiq; aarafiq@gmail.com

Received 11 July 2013; Accepted 25 August 2013

Academic Editor: Allan Peterson

We point out in this paper that the claims made by Li in "A Note on Kang-Rafiq-Kwun Iteration Method for Solving Nonlinear Equations" are not true.

1. Introduction and Explanation

Consider the following nonlinear equation:

$$f(x) = 0, \tag{1}$$

which can be written in the form of the following functional equation:

$$x = g(x), \tag{2}$$

which is the famous fixed point method.

By using the following iterative relation

$$x_{n+1} = x_n + \lambda f(x_n) h(x_n), \tag{3}$$

and the variational iteration method, He [1] established the following iteration method:

$$x_{n+1} = x_n - \frac{h(x_n) f(x_n)}{h(x_n) f'(x_n) + h'(x_n) f(x_n)}; \quad h(x_n) f'(x_n) + h'(x_n) f(x_n) \neq 0. \tag{4}$$

He [1] noted that the value of the auxiliary function $h(x_n)$ should not be zero or small value during all iteration steps, $|h(x_n)| > 1$.

In [2], Li claimed that the iteration method introduced by Kang et al. [3],

$$x_{n+1} = \frac{-g'(x_n) x_n + g(x_n)}{1 - g'(x_n)}, \tag{5}$$

is not new and the formulation was first derived by He [1].

We comment as follows.

(1) Their claim is wrong, because no such derivation or explanation was presented in [1].

(2) For $g(x) = x - h(x) f(x)$, it can be easily seen that the iteration method (5) reduces to (4). Hence, (4) is the special case of (5).

(3) On page 2 of [2], it is interesting to note that for $f(x) = g(x) - x$, the claimed new formulation,

$$x_{n+1} = g(x_n) + \lambda (g(x_n) - x_n), \tag{6}$$

is not new and reduced to

$$x_{n+1} = x_n + \lambda' f(x_n); \quad \lambda' = 1 + \lambda, \tag{7}$$

which is the special case of relation (5).

(4) *Remark 1 (see [2])*. Actually Li pointed out the special case of an already derived method due to Kang et al. [3].

(5) *Remark 2 (see [2])*. The claim is wrong because in [3] the equation $g'_\theta(x_n) = 0 = \theta + g'(x_n)$ is different from the equation (7) in [2].

(6) *Remark 3 (see [2])*. This argument is misleading because in [3] $\theta = -g'(x_n)$ which is not equal to $\lambda = (-g'(x_n))/(g'(x_n) - 1)$ appeared in equation (8) of [2].

(7) *Remark 4 (see [2]).* This statement is meaningless because the approach of Kang et al. [3] is different.

2. Conclusions

All the claims made by Li in [2] are incorrect. However, in order to obtain the variants and generalizations of the Newton-Raphson method, the approach and the performance of the variational iteration formulation can be seen in [4].

Acknowledgment

The authors are greatly thankful to Professor Naseer Shahzad for his valuable suggestions in order to improve this letter.

References

[1] J.-H. He, "Variational iteration method—some recent results and new interpretations," *Journal of Computational and Applied Mathematics*, vol. 207, no. 1, pp. 3–17, 2007.

[2] H. Li, "A note on Kang-Rafiq-Kwun iteration method for solving nonlinear equations," *Abstact and Applied Analysis*. In Press.

[3] S. M. Kang, A. Rafiq, and Y. C. Kwun, "A new second-order iteration method for solving nonlinear equations," *Abstract and Applied Analysis*, vol. 2013, Article ID 487062, 4 pages, 2013.

[4] A. Rafiq, "A note on "new classes of iterative methods for nonlinear equations" and 'some iterative methods free from second derivatives for nonlinear equations,'" *Applied Mathematics and Computation*, vol. 193, no. 2, pp. 572–576, 2007.