عنوان مقاله:

APPLICATION OF VARIATIONAL ITERATION METHOD FOR SOLVING CONVECTIVE LONGITUDINAL FINS WITH VARIABLE THERMAL CONDUCTIVITY

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خلاصه مقاله:

In this paper, the competency of the variational iteration method is illustrated by evaluating the efficiency of straight fins with temperature-dependent thermal conductivity, and by determining the temperature distribution within the fin. It is useful and a practical method, which can be used to solve nonlinear heat diffusion equations which are associated with variable thermal conductivity conditions. In this method, general Lagrange multipliers are introduced to construct correction functionals for the problems. The multipliers in the functionals can be identified optimally via variational theory. Comparison reveals that the approximate solutions obtained by the proposed method converge to its exact solution faster than those of Adomian method. Finally, the fin efficiency is obtained as a function of both thermo-geometric fin parameter and the thermal conductivity parameter. These results will be useful in designing straight fins with temperature-dependent thermal conductivity.

کلمات کلیدی:

Variational iteration method; Variable thermal conductivity; Convective fin; Fin efficiency

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