

Analytical Solving of Nonlinear Differential Equations in the Nonlinear Phenomena for Viscos Fluids

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Abstract : In the paper, our purpose is to enhance the ability to solve a nonlinear differential equation which is about the motion of an incompressible fluid flow going down of an inclined plane without thermal effect with a simple and innovative approach which we have named it new method. Comparisons are made amongst the Numerical, new method, and HPM methods, and the results reveal that this method is very effective and simple and can be applied to other nonlinear problems. It is noteworthy that there are some valuable advantages in this way of solving differential equations, and also most of the sets of differential equations can be answered in this manner which in the other methods they do not have acceptable solutions up to now. A summary of the excellence of this method in comparison to the other manners is as follows: 1) Differential equations are directly solvable by this method. 2) Without any dimensionless procedure, we can solve equation(s). 3) It is not necessary to convert variables into new ones. According to the afore-mentioned assertions which will be proved in this case study, the process of solving nonlinear equation(s) will be very easy and convenient in comparison to the other methods.

Keywords : viscos fluid, incompressible fluid flow, inclined plane, nonlinear phenomena

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