GALERKIN FINITE ELEMENT SOLUTION FOR THE HOMOGENEOUS BURGERS' EQUATION

BY

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DECLARATION

I certify that this is my work and that this thesis has not been presented for a degree award in any University. I have done the work reported herein and all sources of information have been acknowledged by means of references

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ABSTRACT

The Burgers' equation is a very useful mathematical model and can be used in solving a variety of interesting problems in applied mathematics. It models effectively certain problems of a fluid flow nature, in which either shocks or viscous dissipation is a significant factor. The mathematical theory behind the Burgers' equation is rich and interesting, and, in the broad sense, is a topic of active mathematical research. In this study we solve the homogeneous Burgers' equation using Galerkin mixed finite element method with Robin's boundary conditions. We use our results to find out the effect of removing the diffusive term and the convective term on the solution of the Burgers' equation. Our numerical results suggest that the omission of the convective term gives linear results. It is also observed that the approximations obtained without the diffusive term are not steady and they are non-convergent.