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An Averaged-Separation of Variable Solution to the Burger Equation 'KALE OYEDEJI, Morehouse College, RONALD E. MICKENS, Clark Atlanta University — The Burger Partial Differential Equation (PDE) provides a nonlinear model that incorporates several of the important properties of fluid behavior. However, no general solution to it is known for given arbitrary initial and/or boundary conditions. We propose a "new" method for determining approximations for the solutions. Our method combines the separation of variables technique, combined with an averaging over the space variable. A test of this procedure is made for the following problem, where u = u(x,t):

$$0 \leq x \leq 1,\ t > 0,$$

$$u(0,t) = 0,\ u(1,t) = 0,$$

$$u(x,0) = x(1\text{-}x),$$

$$u_t + uu_x = Du_{xx},$$

where D is a non-negative parameter. The validity of the calculated solution is made by comparing it to an exact analytic solution, as well as an accurate numerical solution for the special case where D = 0.

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