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ON SOME EXACT SOLUTIONS OF THE NONLINEAR HEAT EQUATION

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The paper is devoted to finding invariant solutions of the nonlinear heat (filter) equation without sources or sinks in the case of one spatial variable and a power dependence of the thermal conduction coefficient on the temperature. The construction procedure is reduced to Cauchy problems for ordinary differential equations with a singularity at the highest derivative. An existence and unqueness theorem is proved for solutions of such problems in the class of analytic functions (in the form of a converging series). An estimate is obtained for the convergence domain of this series in one particular case.

Keywords: partial differential equations, nonlinear heat (filter) equation, invariant solution, Cauchy problem.

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