Exact Solutions > Nonlinear Partial Differential Equations > Other Second-Order Partial Differential Equations (Equations of Transonic Gas Flow, Monge-Ampere Equations)

4. Other Second-Order Partial Differential Equations

4.1. Equations of Transonic Gas Flow

- 1. $a\frac{\partial w}{\partial x}\frac{\partial^2 w}{\partial x^2} + \frac{\partial^2 w}{\partial y^2} = 0$. Equation of steady transonic gas flow.
- 2. $\frac{\partial^2 w}{\partial y^2} + \frac{a}{y} \frac{\partial w}{\partial y} + b \frac{\partial w}{\partial x} \frac{\partial^2 w}{\partial x^2} = 0$. Equation of steady transonic gas flow.

4.2. Monge-Ampere Equations

- 1. $\left(\frac{\partial^2 w}{\partial x \partial y}\right)^2 \frac{\partial^2 w}{\partial x^2} \frac{\partial^2 w}{\partial y^2} = 0$. Homogeneous Monge-Ampere equation.
- 2. $\left(\frac{\partial^2 w}{\partial x \partial y}\right)^2 \frac{\partial^2 w}{\partial x^2} \frac{\partial^2 w}{\partial y^2} = A$. Nonhomogeneous Monge-Ampère equation.
- 3. $\left(\frac{\partial^2 w}{\partial x \partial y}\right)^2 \frac{\partial^2 w}{\partial x^2} \frac{\partial^2 w}{\partial y^2} = f(x, y)$. Nonhomogeneous Monge-Ampere equation.

The EqWorld website presents extensive information on solutions to various classes of ordinary differential equations, partial differential equations, integral equations, functional equations, and other mathematical equations.

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http://eqworld.ipmnet.ru/en/solutions/npde/npde-toc4.pdf