MR680591 (84g:34008) 34A10 (34C10)

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A half-linear second order differential equation.


Consider the second order differential equation

\[ y''|y'|^{n-1} + p(t)y^n = 0, \]

where the number \( n \) is real and positive, the function \( p(t) \) is continuous on some open interval \( I \subset (-\infty, \infty) \), the primes denote differentiations with respect to the independent variable, and the function \( x^n \) is defined as

\[ x^n = \begin{cases} 
  x^n & \text{if } x \geq 0 \\
  -|x|^n & \text{if } x < 0.
\end{cases} \]

The author first considers the case \( p(t) \equiv 1 \) and points out some connections with the Minkowskian plane \( M_n \). Then he proves the existence and the uniqueness of the solution of the initial value problem for (1). Finally, he obtains some results which generalize Sturm’s comparison theorem for a system of first-order nonlinear equations.

Reviewed by B. G. Pachpatte

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