Integral criteria for oscillation of third order nonlinear differential equations

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Abstract

In this paper we are concerned with the oscillation of third order nonlinear differential equations of the form

\[(r_2(t)(r_1(t)y')')' + p(t)y' + q(t)f(y) = 0, \quad t \geq t_0,\]

where \(t_0 > 0\) is a fixed real number; \(r_1, r_2, p, q : I := [t_0, \infty) \to \mathbb{R}\) are nonnegative continuous functions with \(r_1 > 0, \quad r_2 > 0\); \(f : \mathbb{R} \to \mathbb{R}\) is a continuous function.

By making use of a generalized Riccati transformation we establish some new sufficient integral conditions under which the equation has at least one oscillatory solution. Examples are given to illustrate the importance of our results.

Key words: Oscillatory, Nonoscillatory, Third order, Nonlinear
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