

## A note on the asymptotic behavior of nonoscillatory solutions of half-linear ordinary differential equations

By MANABU NAITO (Matsuyama)

**Abstract.** The asymptotic behavior of nonoscillatory solutions of the half-linear differential equation

$$(p(t)|x'|^\alpha \operatorname{sgn} x')' + q(t)|x|^\alpha \operatorname{sgn} x = 0, \quad t \geq t_0,$$

is discussed. It is assumed that  $P(t) \equiv \int_{t_0}^t p(s)^{-1/\alpha} ds$  ( $t \geq t_0$ ) diverges to  $\infty$  as  $t \rightarrow \infty$ , and that  $Q(t) \equiv \int_t^\infty q(s) ds$  ( $t \geq t_0$ ) exists and is finite. It is shown that, under certain conditions on  $P(t)$  and  $Q(t)$ , if a nonoscillatory solution  $x(t)$  of the above equation satisfies the asymptotic property of the type  $p(t)^{1/\alpha} P(t)[x'(t)/x(t)] \rightarrow \lambda \neq 0$  ( $t \rightarrow \infty$ ), then  $x(t) \sim cP(t)^\lambda$  and  $x'(t) \sim c\lambda p(t)^{-1/\alpha} P(t)^{\lambda-1}$  ( $t \rightarrow \infty$ ), where  $c$  is a nonzero constant.

MANABU NAITO  
DEPARTMENT OF MATHEMATICS  
FACULTY OF SCIENCE  
EHIME UNIVERSITY  
MATSUYAMA 790-8577  
JAPAN

---

*Mathematics Subject Classification:* 34C11, 34C10.

*Key words and phrases:* asymptotic behavior, nonoscillatory solution, half-linear differential equation.