

ZMATH 2010f.00842

Kroopnick, Allan J.

Bounded solutions to $x'' + q(t)b(x) = f(t)$.

Int. J. Math. Educ. Sci. Technol. 41, No. 6, 829-836 (2010).

Summary: This article discusses the conditions under which all solutions to $x'' + q(t)b(x) = f(t)$ are bounded on $[0, \infty)$. These results are generalizations of the linear case. A short discussion of the properties of bounded oscillatory solutions for both the linear and nonlinear cases when $f(t) = 0$, $xb(x) > 0$ and $b'(x) > 0$ for $x \neq 0$ is also provided. Finally, we shall see that the previous arguments may be applied to the more general nonlinear differential equation $x'' + c(t, x, x') + q(t)b(x) = f(t)$ with appropriate conditions on $c(t, x, x')$.

Classification: I75

Keywords: bounded; boundedness; absolutely integrable; oscillatory; continuously differentiable; nonlinear differential equations

doi:10.1080/00207391003777863