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Averaging Method For Nonlinear Cubic Oscillator[1] RONALD E. MICKENS, Clark Atlanta University, Atlanta, GA 30314, 'KALE OYEDEJI, Morehouse College, Atlanta, GA 30314-3773 — The nonlinear cubic equation is the following second-order differential equation (*) $\ddot{x} + x^3 =\in f(x, \dot{x})$, where $\in$ is a small parameter and f is a polynomial function of its arguments. In Mickens and Oyedeji (J. Sound and Vibration, Vol. 102, 579-582 (1985), we constructed a first-order averaging method for calculating approximations to the oscillatory solutions of Eq. (*). The purpose of the current work is to provide a generalization of this technique. This generalization comes from a new interpretation as to how the averaged equations should be solved. We compare solutions calculated using both the old and new procedures, and show that the new methodology eliminates certain mathematical inconsistencies inherent in the original formulation.

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