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Calculation of Approximations to the Periodic Solutions for the Cubic- Root Oscillator[1] DORIAN WILKERSON, R.E. MICKENS, Clark Atlanta University, Atlanta, GA 30314 — The cubic-root oscillator (CRO) is modeled by the following second-order, nonlinear differential equation (*) $\ddot{x} + x^{\frac{1}{3}} = 0, x(0) = A, \dot{x}(0) = 0.$ First, we show that all solutions to Eq. (*) are periodic. Second, we calculate the exact value of for the period T(A). Third, two techniques are used to calculate approximations for the periodic solutions; these techniques are the methods of harmonic balance and iteration. Generalization of this methodology to other "truly nonlinear (TNL)" oscillators will also be discussed.

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'Kale Oyedeji
Morehouse College, Atlanta, GA 30314-3773

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