

Abstract Submitted
for the SES17 Meeting of
The American Physical Society

Construction and Preliminary Investigation of Properties of the Imani Periodic Functions RONALD E. MICKENS, Clark Atlanta University, Atlanta, GA 30314 — The Imani periodic functions (IPF) are continuous periodic solutions to the Leah functional equation (LFE) (1) $\frac{y^2}{2} + \left(\frac{3}{4}\right)x^{\frac{3}{4}} = \frac{3}{4}$, $x(0) = 1$, $y(0) = 0$, where $x = x(t)$ and $y = y(t)$, and (2a) $x(t+T) = x(t)$, $y(t+T) = y(t)$, (2b) $x(-t) = x(t)$, $y(-t) = -y(t)$, and, T is a fixed, but arbitrary positive constant. Explicit representations are derived for these functions using nonlinear transformations of the dependent variables. We also obtain several of their mathematical properties. It should be noted that an alternative interpretation of Eq. (1) is that it is the Hamiltonian of a nonlinear oscillator having equation of motion (3) $\frac{d^2x}{dt^2} + x^{\frac{1}{3}} = 0$, $x(0) = 1$, $\frac{dx(0)}{dt} = 0$, where $y(t) = dx(t)/dt$. Finally, while all of the solutions to Eq.(3) are periodic, Eq. (1) may have non-periodic solutions.

Kale Oyediji
Morehouse Coll

Date submitted: 28 Aug 2017

Electronic form version 1.4