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Ronald E. Mickens* (rmickens@cau.edu), Clark Atlanta University, Department of Physics, Atlanta, GA 30314. *The Imani Periodic Functions.*

The Imani functions are special classes of periodic solutions to the Leah function equation (LFE)

$$L(x, y) : \frac{y^2}{2} + \left(\frac{3}{4}\right) x^{4/3} = \frac{3}{4}$$

$$x(0) = 1, \quad y(0) = 0,$$

where $x = x(t)$ and $y = y(t)$. These functions correspond to generalizations of the standard trigonometric cosine and sine functions and, by explicit construction, have analogous mathematical properties. We also demonstrate that a similar class of periodic functions may be expressed in terms of the Jacobi cosine and sine functions [1]. For background to this topic, the paper of Mickens [2] provides a broad discussion of periodic solutions to the functional equation $x^2 + y^2 = 1$.

References

- [1] P. F. Byrd and M. D. Friedman, Handbook of Elliptic Integrals for Engineers and Physicists (Springer-Verlag, Berlin, 1954).
- [2] R. E. Mickens, Periodic solutions of the functional equation $f(t)^2 + g(t)^2 = 1$, Journal of Difference Equations and Applications, 22 (2016), 67–74. (Received September 07, 2017)