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**Dynamics of the Hamiltonian  $H(x,y) = |x|+|y|$**  KALE OYEDEJI, Morehouse Coll, RONALD E. MICKENS, Clark Atlanta Univeristy — We investigate the classical dynamics of the Hamiltonian (1)  $H(x,y) = |x| + |y|$ , and normalize the energy value to be  $H(x,y) = 1$ . The equations of motion are (2)  $\frac{dx}{dt} = \frac{\partial H}{\partial y} = \text{sgn}(y)$ ,  $\frac{dy}{dt} = -\frac{\partial H}{\partial x} = -\text{sgn}(x)$ . In addition to proving all solutions are periodic, we also calculate explicitly the exact analytical solutions to Eq. (2). Further, we show that  $x(t)$  and  $y(t)$  have many features in common with the standard trigonometric cosine and sine functions. The work is based on the previous results of Mickens [1]. Reference [1] R.E. Mickens, “Some properties of square (periodic) functions”. Proceedings of Dynamic Systems and Applications 7 (2016), 282-286.

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