

Abstract Submitted
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On a Connection Between the Eigenvalues of the One-dimensional Finite Square Well and Number Theory WALTER JARONSKI, Radford University — The problem of the one-dimensional finite square well is a standard exercise in the introductory quantum mechanics course. As is well known, the energy eigenvalues cannot be determined in closed form. However, for a given range of the well parameter, the energies can be represented as an infinite series in this parameter. Although this series cannot be summed to give a common function, the coefficients in the series can be determined from a simple formula. In particular, for small values of the well parameter, the coefficients can be expressed in terms of generalized Euler numbers. This technique will be compared with standard numerical procedures for determining the energies, with regard to both computational ease and pedagogical benefits. The opportunity to introduce students to new mathematics will be emphasized.

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