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Eleanor S Farrington* (efarrington@maritime.edu), 101 Academy Dr, Buzzards Bay, MA 02155. *The Arithmetic-Geometric Mean of genus 1 with Applications to genus 2 and 3*. Preliminary report.

The relation between elliptic curves and the arithmetic-geometric mean was discovered by Lagrange and Gauss as a method of calculating elliptic integrals. This classical approach is limited to cases where the elliptic curve is given by a cubic equation with three real roots. We define an arithmetic-geometric mean for all elliptic curves over \mathbb{C} and detail the choices implicit in the classical construction. With this full understanding of the genus 1 case, we will consider its applications to computing the arithmetic-geometric mean of genus 2 and 3 curves with split Jacobians. (Received September 22, 2011)