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Jonathan M. Gerhard* (gerha2jm@dukes.jmu.edu). *An exact product formula for abelian threefolds*. Preliminary report.

Let f be the characteristic polynomial of Frobenius of an abelian variety of dimension 3 over a finite field; we use f to relate three seemingly disjoint objects. First, we consider the factorizations of primes in $\text{Split}(f)$, a degree 6 number field K . Second, we use a parameterization of Shinoda (1980) to describe certain conjugacy classes of the matrix group $\text{GSp}_6(\mathbb{F}_q)$. Our main result (following Gekeler (2003) and Achter and Williams (2015)) is a product formula relating the class number of K to the relative densities of conjugacy classes of $\text{GSp}_6(\mathbb{F}_q)$. Finally, we give a (conjectural) application of our formula to the size of isogeny classes of abelian threefolds. (Received August 21, 2016)