1046-14-1062 **Emma Previato*** (ep@bu.edu), Department of Mathematics and Statistics, Boston University, Boston, MA 02215-2411, and **Shigeki Matsutani**. *Abelian formulas for cyclic curves.*

Generalized elliptic curves called $C_{a,b}$ curves, namely $f(x,y) = y^a + x^b + f_{a-1,b-1}(x,y)$ (a and b coprime positive integers and in $f_{a-1,b-1}(x,y)$, a monomial $x^r y^s$ satisfies $ar + bs < ab$), have emerged in areas as different as number theory and PDEs. Generalizing the genus-1 equation (Kiepert) for the nonzero points of period n, the determinant $\sigma(nz)/\sigma(z)^{n^2}$ of a matrix with entries derivatives of the $\wp$ function, we give a determinantal equation for a polynomial in (x,y) that vanishes at a point P of a $C_{a,b}$ curve iff the Abel image of nP belongs to the theta divisor Θ. We use addition theorems generalizing Klein-Baker's work on the higher-genus Weierstrass σ function (J.C. Eilbeck, V.Z. Enolski, S. Matsutani, Y. Ônishi and E. Previato, *Int. Math. Res. Not.* 2008). For such curves with a specific group action we give more refined statements on the stratification of Θ. For a genus-3 curve that admits an automorphism of order 3 with quotient $\mathbb{P}^1$ we find formulas that generalize Jacobi's $\mathrm{sn}^2(z) + \mathrm{cn}^2(z) = 1$ (for a hyperelliptic curve, cf. S. Matusutani, *Surv. Math. Appl.* 2008). (Received September 14, 2008)