Dem'yanenko, V. A.

On Abel relations. (Russian) Zbl 0629.14025

Zap. Nauchn. Semin. Leningr. Otd. Mat. Inst. Steklova 151, 54-56 (1986).

Let E be the elliptic curve $y^2 = x^3 + rx + s$, $\{0_{m,1}, 0_{m,2}\}$ be a basis of torsion points of order m on E, $(x_{a,b}, y_{a,b}) := a0_{m,1} + b0_{m,2}$, $\epsilon = e^{2\pi i/m}$. Set $q = (a, b, m)$, $a = qa_1$, $b = qb_1$,

$$H_{a,b} = y_{a,b}^2 \prod_{t=1}^{m-1} (x_{a,b} - x_{ta_1,tb_1}) \quad (t \neq q, m-q),$$

$$F_{a,b;c,d} = \prod_{t=1}^{m-1} (x_{a,b} - x_{t(a-c)/r,t(b-d)/r}), r = (a-c, b-d, m),$$

$$L_{a,b;c,d} = H_{a,b}/F_{a,b;c,d}.$$

The author proves the following nice formula: $L_{a,b;c,d} = \epsilon^{ad-bc} L_{c,d;a,b}$. The particular cases $\{a, b; c, d\} = \{a, b; a, 0\}, \{a, b; 0, b\}$ were already proved by the author in J. Sov. Math. 29, 1272-1275 (1985); translation from Zap. Nauchn. Semin. Leningr. Otd. Mat. Inst. Steklova 121, 58-61 (1983; Zbl 0539.14021).

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