Erratum to: "Two-torsion in the Jacobian of hyperelliptic curves over finite fields"

Arch. Math. **77** (2001), 241–246

By

Gunther Cornelissen

In the proof of Theorem 1.4, it was overseen that condition (2.6.2) imposes an extra relation whenever $k \equiv 2 \bmod 4$, even if $s > 1$. Therefore, the statement of this theorem should be corrected as follows:

(1.4) Theorem. *For the 2-rank of J_D the following holds:*
(*a*) $\hat{r}_2(D) = s - 2$ *if k is even and some d_i is odd;*
(*b*) $\hat{r}_2(D) = s - 1$ *if [k is odd] or [all d_i are even and $k \equiv 2 \bmod 4$];*
(*c*) $\hat{r}_2(D) = s$ *if all d_i are even and $k \equiv 0 \bmod 4$.*

Corollaries (1.6) and (1.7) should be adapted correspondingly as follows:

(1.6) Corollary. *The following only happens when D has only factors of even degree and k is divisible by 4:*

(*a*) *For an imaginary discriminant D of even degree, all two-torsion classes in $\mathrm{Pic}(\mathcal{O}_D)$ have even degree;*

(*b*) *Let ρ be the prime-to-2 part of $|R_D|$. For a real discriminant D, the divisor $\rho(\infty_1 - \infty_2)$ is not further divisible in $J_D(\mathbf{F}_q)[2^\infty]$.*

(1.7) Corollary. *Let D be real, such that $|R_D|$ is even. If D has a factor of odd degree, or all factors of D are of even degree and $k \equiv 2 \bmod 4$, then there exists a point of order > 2 in $J_D(\mathbf{F}_q)[2^\infty]$.*

Finally, in (3.1) (alternative proof of (1.6)), the last three lines should be taken out.

A c k n o w l e d g m e n t. I thank Andreas Schweizer for spotting the above mistake.

Gunther Cornelissen
Utrecht University
Department of Mathematics
P.O. Box 80010
NL-3508 TA Utrecht

e-mail `cornelis@math.uu.nl`