Algebraic Curves over a Finite Field

Errata

Last updated 28th July 2009

Page 52, line –5: $\mathbf{v}(Y_0 - \lambda Y_2)$

Page 58, line –13: $F_m(1,t) \neq 0$

Page 59, line –16: $\mathcal{F} = \mathbf{v}_a(f(X,Y))$

Page 78, line –5: $i > 0$

Page 79, line 2: are primitive branch representations

Page 79, line –3: $u + t^n(b_0 + \ldots + b_h t^{hm})^{n-1} nct^s + \ldots$

Page 86, line –17: $\ldots + XH(X,Y)$

Page 86, line –11: $\ldots + XH_1(X,Y)$

Page 86, line –10: $\ldots + XH_2(X,Y)$

Page 87, line –13: $\ldots + XH(X,Y)$

Page 244, line 11: $\deg g(X,Y) \leq g+2$

Page 245, line 19: $f(X), g(X) \in K[X]$

Page 245, line 21: $f(X)$ and $g(X)$

Page 313, line –13: If $p > 2$ and $p \nmid \deg f(X)$, then

Page 314, line –12: The hypothesis that $p \nmid \deg f(X)$ cannot be dropped. For $p = 3$ and $q = 27$, the curve

$$\mathcal{C} = \mathbf{v}(y^{13} - (X^{13} + X^9 + X^3 + X))$$

is Frobenius non-classical. Since $\mathcal{C}$ is singular and has degree 13 it cannot be birationally equivalent to the non-singular curve $\mathcal{F}$, given by (8.61), which has the same degree 13.

The curve $\mathcal{C}$ is Frobenius non-classical since, with

$$z_0 = -(X^3 + X),\ z_1 = -1,\ z_2 = Y^4,\ h(X,Y) = 1,\ t(X,Y) = 1,$$

both (7.21) and (8.32) hold, and Theorem 8.72 applies.

Page 349, lines –4 to –3: For other curves attaining the Serre Bound, see Section 12.5.

Page 396, line 7: (iii) $L_{\mathbf{F}_{q^2}}(t) = (1+qt)^{2g}$.

Page 424, line –1: , $a_0a_2 + a_1^2 = 0.$

Page 425, lines 3–4:

$$(a_1^q - a_1)^2 + a_3^{q+1},$$

whence either $a_1^q - a_1 - a_3^{(q+1)/2} = 0$ or $a_1^q - a_1 - a_3^{q+1} = 0$. Replace a_1 by ca_1 and a_3 by da_3 where $c = d^{(q+1)/2}$ for a primitive element d of $\mathbf{F}_{q^2}$, and note that $c^q + c = 0$. Comparison

Page 447, line 18: $L_q(t) = (1 + 2q_0t + q^2t)^g$.

Page 454, line –1: $\mathbf{v}(Y^{p^n} - Y + cX^{p^n+1} + L(X))$

Page 457, line 9: Let $q = n^3 > 8$

Page 463, line 17: $x' = (ax + b)/(cx + d)$

Page 503, line 9: **Theorem 11.94** The

Page 506, line 19: $(x, y) \mapsto (x, y + h(x))$

Page 506, line –7: if $\mathcal{F}$ has at least three Weierstrass points, the hyperelliptic involution is the only non-trivial

Page 538, line –6: For $g \geq 13$,

Page 538, line –4: a contradiction. If $4 \leq g \leq 12$ then $|S_2| = 8$ and

$$24g^2 < |G| = |\bar{G}||M| \leq 288,$$

a contradiction.

Page 552, line –4:

(ii) If $|G_P^{(1)}| > \begin{cases} 2g/3 & \text{when } p = 2, \\ gp/(p-1) & \text{when } p > 2, \end{cases}$

then $B(X) = XR(X)$ where $R(X) = a_0X + a_1X^p + \cdots + a_rX^{p^r} \in K[X]$ is an additive polynomial.

Page 575, line 14: $y^q = x^q y_1^{3q_0} - y_2^{3q_0}$

Page 625, line –8: In Section 13.4, Theorem 13.39 is due to J. A. Thas, P. J. Cameron, and A. Blokhuis, On a generalization of a theorem of B. Segre, *Geom. Dedicata* **43** (1992), 299–305.

Page 648, line –11: subgroups for $q > 3$: