General Galois Geometries

Errata

Last updated 10th August 2010

xii –1 : INDEX . . . 401

15 +6 : $\sum_{i<j} \to \sum_{i\leq j}$

21 +9 : $\mathcal{V}' \to \mathcal{W}'$

29 –12 : Lemma 22.6.5

29 –9 : as in the case $\mathcal{W}_m^{(1)} \cap \mathcal{W}_m^{(2)} \neq \emptyset$

30 –20, –17, –7 : Lemma 22.6.5

34 –19: §22.6

43 –8: Theorem 22.6.6

62 –5 : Let $P = \mathbf{U}_0$ and choose $\mathbf{U}_1 \in \mathcal{U}_n$, but not in the tangent prime T_P.
Choose $\mathbf{U}_2, \ldots, \mathbf{U}_n$ in $T_P \cap T_{\mathbf{U}_1}$. Then by a suitable ...

64 +6 : ... the only term involving $\overline{x}_{n-1}$ is $cx_n\overline{x}_{n-1}$ with $c \neq 0$ and ...

64 +8 : The non-singularity of $\mathcal{U}$ is equivalent to $c \neq 0$. Thus ...

72 –16 : $r = \frac{1}{2}q + 1$

100 +3 : $\mathbf{P}(X_1), \ldots, \mathbf{P}(X_r)$

102 –13 : $\{j_0, j_1, \ldots, j_{n-r-1}\} \cup \{i_0, i_1, \ldots, i_r\} = \{0, 1, \ldots, n\}$, with
$j_0 < j_1 < ... < j_{n-r-1},\ i_0 < i_1 < \cdots < i_r$,

102 –8 : $\rho l_i = \hat{l}_{i+\mathbf{c}(2r+2,r+1)/2}$, where indices are taken modulo $\mathbf{c}(2r + 2, r + 1)$.

102 –5 : differ by $\mathbf{c}(2r + 2, r + 1)/2$.

102 –5 : Just before Lemma 24.1.3, add the following:

In Lemma 24.1.3, for $n = 2r + 1$ and r even, the following condition is not imposed: for a coordinate $(i_0i_1 \ldots i_r)_x$ of Π_r and a dual coordinate $(j_0j_1 \ldots j_r)_u$ of Π_r with $|\{i_0, i_1, \ldots, i_r\} \cup \{j_0, j_1, \ldots, j_r\}| = n+1$, the permutation $(i_0, i_1, \ldots, i_r, j_0, j_1, \ldots, j_r)$ has to be even.

104 +10 : $X_i = (x_0^i, x_1^i, \ldots, x_n^i)$

104 –12 : $(r + 1) \times (n + 1)$ matrix

104 –2 : $(-1)^{r+1}(j_r i_1 \dots i_r)(i_0 j_0 \dots j_{r-1})$

108 –4 : *Proof* : It may be supposed that $n \neq 2r+1$. So, suppose that ...

109 +8 : Now consider in more detail the case that $n = 2r+1$. Here, assume that for any two coordinates $(i_0 i_1 \dots i_r)_x$ and $(j_0 j_1 \dots j_r)_x$ of Π_r where $|\{i_0, i_1, \dots, i_r\} \cup \{j_0, j_1, \dots, j_r\}| = 2r+2$, the positions differ by $\mathbf{c}(2r+2, r+1)/2 = m$; if $l_i = (i_0 i_1 \dots i_r)_x$ and $l_{i+m} = (j_0 j_1 \dots j_r)_x$, $i \in \{0, 1, \dots, m-1\}$, then assume that the permutation $(i_0, i_1, \dots, j_r)$ is even.

109 +16, +18, (24.14), –7, (24.15): $\sum_{i=0}^{r+1} \to \sum_{i=0}^{m-1}$, $i + r \to i + m$

110 +6 : $\rho l'_i = l_{i+m}$, $i = 0, 1, \dots, m-1$, $\rho l'_i = (-1)^{r+1} l_{i+m}$,
$i = m, m+1, \dots, N$ (indices being taken modulo $N+1$). Hence ...

110 +9 : $\rho x'_i = x_{i+m}$, $i = 0, 1, \dots, m-1$, $\rho x'_i = (-1)^{r+1} x_{i+m}$,
$i = m, m+1, \dots, N$, of $PG(N, K)$ ...

136 –15 : $\pi \cap \pi' \neq \emptyset$

138 +18 : Then $(\mathcal{S}, \mathcal{B})$

148 –12 : Hence $\mathcal{C}\zeta^{-1}$ → Hence, for $q \geq 4$, the set $\mathcal{C}\zeta^{-1}$ contains at least q collinear points. So the line containing these points is mapped by ζ onto $\mathcal{C}$, and consequently $\mathcal{C}\zeta^{-1}$ is necessarily a line of the plane π. For $q \in \{2, 3\}$, let $GF(q^h)$ be a proper extension of $GF(q)$. If $\overline{\mathcal{C}}, \overline{\pi}$ and $\overline{\zeta}$ are the corresponding extensions of $\mathcal{C}, \pi$ and ζ, then $\overline{\mathcal{C}\zeta}^{-1}$ is a line of the plane $\overline{\pi}$. Hence $\mathcal{C}\zeta^{-1}$ is also a line of the plane π. It has therefore ...

149 –11 to –2: ... mapping of $\mathcal{V}_n$. Consider distinct points P_1, P_2 on $\mathcal{V}_n$; they are contained in exactly one conic $\mathcal{C}$ on $\mathcal{V}_n$. Let π be the plane of $\mathcal{C}$; then the projectivity $\widetilde{\eta}$ fixes all points of $\mathcal{C}$, and so fixes each point of π. In particular, $\widetilde{\eta}$ fixes all points of the line P_1P_2. By the corollary of Theorem 25.1.3, the Veronesean $\mathcal{V}_n$ generates $PG(N, q)$. Let $P_1, P_2, \dots, P_{N+1}$ be $N+1$ linearly independent points on $\mathcal{V}_n$. The projectivity $\widetilde{\eta}$ fixes all points of the lines P_1P_2 and P_1P_3, and so fixes all points of the plane π_2 containing P_1, P_2, P_3. As $\widetilde{\eta}$ fixes all points of the plane π_2 and the line P_1P_4, it fixes all points of the 3-dimensional space generated by P_1, P_2, P_3, P_4. Analogously, $\widetilde{\eta}$ fixes all points of the 4-dimensional space generated by P_1, P_2, P_3, P_4, P_5. This procedure leads to a proof that $\widetilde{\eta}$ fixes all points of the subspace generated by $P_1, P_2, \dots, P_{N+1}$; that is, it fixes all points of $PG(N, q)$. Hence $\widetilde{\eta}$ is the identity mapping of $PG(N, q)$; so $\widetilde{\zeta} = \widetilde{\zeta}'$.

189 +13 : dimension $n_1 + n_2 + \cdots + n_k$

191 –2 : $\mathcal{S}_{1;2}$

191 –1 : $\mathcal{S}_{1;2}$

214 +1 : $\mathrm{sp}(P, P')$

214 –10 : $\mathcal{Q}(5, q)$

235 –8 : $\{P, P_1\}^{\perp} \backslash \{P\}$

273 –9 : $\alpha = s$

282 +20 : Theorem 26.4.15 to Thas and Payne (1976)

376 +28 : An essay on skew translation generalized quadrangles.

383 –1 : finite generalized quadrangles.

391 –19 : $\mathcal{N}(\mathcal{U}_n)$ ... 63

395 +5 : $(\mathcal{P}, \mathcal{B}^*, \in)$ ... 240

401 +6,+7 (left column): interchange these lines

401 –21 (left column) : $PG(4,9)$

401 +12 (right column) : correlation xiii

406 +18 (right column) : Grassmannian