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Correction

Correction: Komeda et al. Algebraic Construction of the Sigma Function for General Weierstrass Curves. *Mathematics* 2022, *10*, 3010

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The authors wish to make the following corrections to this paper [1]:

Text Correction:

There were nine errors in the original publication [1], related to the incorrect use of the mathematical terminology Galois covering; this should be referred to as holomorphic r-sheeted covering.

The first correction has been made to **2. Weierstrass Canonical Form and Weierstrass Curves (W-curves), 2.5.1 Galois Covering, the second paragraph:**

Following the above description, we consider the W-curve X. The covering $\varpi_r : X \to \mathbb{P}$ $((x, y_\bullet) \mapsto x)$ is obviously a holomorphic r-sheeted covering. When we obtain the Galois group on X, i.e., $\mathrm{Gal}(\mathcal{Q}(R_X)/\mathcal{Q}(R_{\mathbb{P}})) = \mathrm{Aut}(X/\mathbb{P}) = \mathrm{Aut}(\varpi_r)$, this is denoted by G_X. The ϖ_r is a finite branched covering. A ramification point of ϖ_r is defined as a point that is not biholomorphic. The image ϖ_r of the ramification point is called the branch point of ϖ_r. The number of finite ramification points is denoted by $\ell_{\mathfrak{B}}$.

The second correction has been made to **2. Weierstrass Canonical Form and Weierstrass Curves (W-curves), 2.5.1. Galois Covering, the third paragraph:**

We basically focus on the holomorphic r-sheeted covering $\varpi_x = \varpi_r : X \to \mathbb{P}$. G_x denotes the finite group action on $\varpi_r^{-1}(x)$ for $x \in \mathbb{P}$, referred to as group action at x in this paper.

The third correction has been made to **2. Weierstrass Canonical Form and Weierstrass Curves (W-curves), 2.5.3. Embedding of X into $\mathbb{P}^{2(m_X-1)}$, Lemma 9, 2:**

2. *for a group action* $\widehat{\zeta} \in G_x$, $\dfrac{\widetilde{h}_{R_X}(x, \widehat{\zeta}y_\bullet, \widehat{\zeta}y'_\bullet)}{\widetilde{h}_{R_X}(x, \widehat{\zeta}y_\bullet, \widehat{\zeta}y_\bullet)} = \dfrac{\widetilde{h}_{R_X}(x, y_\bullet, y'_\bullet)}{\widetilde{h}_{R_X}(x, y_\bullet, y_\bullet)}$.

The fourth correction has been made to **3. W-Normalized Abelian Differentials on X, 3.1. W-Normalized Abelian Differentials $\mathbf{H}^0(X, \mathcal{A}_X(*\infty))$, Lemma 16, 1:**

1. *for the case* $x' = x$ and a group action $\widehat{\zeta} \in G_x$, $\dfrac{\widetilde{h}_X(x, \widehat{\zeta}y_\bullet, \widehat{\zeta}y'_\bullet)}{\widetilde{h}_X(x, \widehat{\zeta}y_\bullet, \widehat{\zeta}y_\bullet)} = \dfrac{\widetilde{h}_X(x, y_\bullet, y'_\bullet)}{\widetilde{h}_X(x, y_\bullet, y_\bullet)}$.

The fifth correction has been made to **3. W-Normalized Abelian Differentials on X, 3.1. W-Normalized Abelian Differentials $\mathbf{H}^0(X, \mathcal{A}_X(*\infty))$, Proposition 13, the second paragraph:**

Further, this relation is extended to the condition $Q \in \mathfrak{B}_X \setminus \{\infty\}$ *by considering the multiplicity of the action* $G_{\varpi_r(Q)}$.

The sixth correction has been made to **3. W-Normalized Abelian Differentials on X, 3.3.1. The One-Form Σ on X, Proposition 15, 1:**

1. *For a group action* $\widehat{\zeta} \in G_{\varpi_r(P)}$, $\Sigma(\widehat{\zeta}P, \widehat{\zeta}Q) = \Sigma(P, Q)$ if $\varpi_r(P) = \varpi_r(Q)$.

The seventh correction has been made to **3. W-Normalized Abelian Differentials on X, 3.3.5. W-Normalized Differentials of the Second Kind, Theorem 3, 2 (b):**

check for updates

Citation: Komeda, J.; Matsutani, S.; Previato, E. Correction: Komeda et al. Algebraic Construction of the Sigma Function for General Weierstrass Curves. *Mathematics* 2022, *10*, 3010. *Mathematics* **2023**, *11*, 2164. https://doi.org/10.3390/math11092164

Received: 20 April 2023
Accepted: 21 April 2023
Published: 5 May 2023

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(b) *for any* $\zeta \in G_{\varpi_r(P)}$, $\Omega(\zeta P, \zeta Q) = \Omega(P, Q)$ if $\varpi_r(P) = \varpi_r(Q)$.

The eighth correction has been made to **3. W-Normalized Abelian Differentials on *X*, 3.3.5. W-Normalized Differentials of the Second Kind, Lemma 30:**

Lemma 30. *If X is the Galois covering on* $\mathbb{P}$*, for the Galois action* $\widehat{\zeta} \in G_X$*, i.e.,* $\widehat{\zeta} : X \to X$*, its associated element* $\rho_{\widehat{\zeta}}$ *of* $\mathrm{Sp}(2g, \mathbb{Z})$ *acts on* (ω', ω'') *and* (η', η'') *by*

$$\widehat{\zeta}(\omega', \omega'') = (\omega', \omega'')\, {}^t\rho_{\widehat{\zeta}}, \quad \widehat{\zeta}(\eta', \eta'') = (\eta', \eta'')\, {}^t\rho_{\widehat{\zeta}},$$

and the generalized Legendre relation (35) is invariant for the action.

The ninth correction has been made to **4. Sigma Function for W-curves, 4.3. Sigma Function and W-curves, Theorem 4, 7:**

7. *If* $\widehat{\zeta} \in G_X$ *satisfies* $\widehat{\zeta}^\ell = \mathrm{id}$*, and* $\widehat{\zeta}[\sigma(u + \widetilde{\ell})/\sigma(u)] = \sigma(u + \widetilde{\ell})/\sigma(u)$ *for* $\widetilde{\ell} \in \Gamma_X$ *and* $u \in \mathbb{C}^g$*, the action provides the one-dimensional representation such that*

$$\widehat{\zeta}\sigma(u) = \rho_{\widehat{\zeta}}\sigma(u),$$

where $\rho_{\widehat{\zeta}}^\ell = 1$.

The authors state that the scientific conclusions are unaffected. This correction was approved by the Academic Editor. The original publication has also been updated.

Reference

1. Komeda, J.; Matsutani, S.; Previato E. Algebraic construction of the sigma function for general Weierstrass curves. *Mathematics* **2022**, *10*, 3010. [CrossRef]

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