Advances in Pure Mathematics, 2014, 4, 680-681
Published Online December 2014 in SciRes. http://www.scirp.org/journal/apm
http://dx.doi.org/10.4236/apm.2014.412077

Scientific Research

Erratum to "Weierstrass' Elliptic Function Solution to the Autonomous Limit of the String Equation of Type (2,5)" [Advances in Pure Mathematics 4 (2014), 494-497]

Yoshikatsu Sasaki

Department of Mathematics, Hiroshima University, Higashi-Hiroshima, Japan
Email: sasakiyo@hiroshima-u.ac.jp

Received 1 June 2014; revised 3 July 2014; accepted 15 July 2014

The original online version of this article (Sasaki, Y. (2014) Weierstrass' Elliptic Function Solution to the Autonomous Limit of the String Equation of Type (2,5). ***Advances in Pure Mathematics*****, 4, 494-497. http://dx.doi.org/10.4236/apm.2014.48055) was published in August, 2014. Unfortunately, it contains several mistakes. The author wishes to correct the following errors in [1]:**

P. 494, L. 7-: The string equation of type (q, p) should be correctly read as

$$[Q,P]=1,\ Q:=D^q+\Sigma_{k=2}^{q}w_kD^{q-k},\ P:=D^p+\Sigma_{k=2}^{p}v_kD^{p-k}.$$

P. 496, L. 13 - 14: Theorem B should be correctly read as follows:

Theorem B. The autonomous limit Equation (A) has a solution concretely described by the Weierstrass' elliptic function as

$$w(z)=\kappa\wp(z),$$

where $\kappa=1$ or 3.

P. 496, L. 17: In Remark, g_2 and g_3 in the elliptic function theory should be correctly read as follows:

$$\begin{cases} g_2=-4a,\ g_3=\dfrac{4}{3}b & \text{for } \kappa=1, \\ g_2=-\dfrac{4}{21}a,\ g_3=-\dfrac{4}{81}b & \text{for } \kappa=3. \end{cases}$$

P. 496, L. 21: In the r.h.s. of Equation (1), " $w^{(4)}$ " should be correctly read as " $-w^{(4)}$ ".

P. 496, L. 3- - P. 497, L. 2: These 5 lines should be correctly read as follows:

If both of (2) and (3) are valid, then a_0 must vanish and a_1 coincides with 4 or $\frac{4}{3}$.

Case $a_0 = 0$ **and** $a_1 = 4$**:** In this case, we immediately obtain $a_2^2 = 2(B-4a)$, $a_3 = B$, $a_4 = -\frac{1}{4}B\sqrt{2(B-4a)} - \frac{4}{3}b$, where B is a root of $\frac{5}{8}B^2 - 2aB + \frac{4}{3}b\sqrt{2(B-2a)} = c$. Inversely, if these are satisfied, both of (2) and (3) are valid. $w'^2 = 4w^3 + a_2 w^2 + a_3 w + a_4$ can be reduced to $v'^2 = 4v^3 - g_2 v - g_3$ by $w = v - a_2/3$. But, for brevity, now we put $a_2 = 0$, and then $a_3 = B = 4a$, $a_4 = -\frac{4}{3}b$, *i.e.* $w'^2 = 4w^3 + 4aw - \frac{4}{3}b$. Here $g_2 = -4a$ and $g_3 = \frac{4}{3}b$. The irrational equation satisfied by B determines the integral constant c in the r.h.s. of (2) as $c = 2a^2$.

Case $a_0 = 0$ **and** $a_1 = \frac{4}{3}$**:** In this case, we easily obtain $a_2 = 0$, $a_3 = \frac{4}{7}a$, $a_4 = \frac{4}{9}b$. Only $c = \frac{2}{49}a^2$ is allowed as the integral constant c in the r.h.s. of (2). Inversely, if these are satisfied, both of (2) and (3) are valid. $w'^2 = \frac{4}{3}w^3 + \frac{4}{7}aw + \frac{4}{9}b$ is reduced to $v'^2 = 4v^3 - g_2 v - g_3$ by $w = 3v$, and then $g_2 = -\frac{4}{21}a$ and $g_3 = -\frac{4}{81}b$. □

References

[1] Sasaki, Y. (2014) Weierstrass' Elliptic Function Solution to the Autonomous Limit of the String Equation of Type (2,5). *Advances in Pure Mathematics*, **4**, 494-497. http://dx.doi.org/10.4236/apm.2014.48055