TABLE ERRATA


On p. 103, the right side of formula 52 should read in part:

\[-\frac{1}{2} + \pi^{1/2}x^{-1} \frac{\Gamma(\nu + 1)}{\Gamma(\nu + 1/2)} \left( 1 - \frac{t^2}{x^2} \right)^{\nu - 1/2}, \quad 0 < t < x < \pi.\]

The right side of formula 54 corresponding to $0 < x < t < \pi$ should read $-1/\pi^{1/2}$ instead of $-(\frac{1}{2} + \nu)/\pi^{1/2}$. The portion of this formula relating to the interval $0 < t < x < \pi$ is correct, but a simpler expression for this region is

\[-\frac{1}{\pi^{1/2}} + \frac{1}{\pi^{1/2}} \left( \frac{2\nu + 1}{x} \right) \int_0^{\cos^{-1}(t/x)} \sin^{2\nu} \theta \, d\theta,\]

which may be written in terms of the hypergeometric function as given, or as

\[-\frac{1}{\pi^{1/2}} + \frac{\pi \Gamma(\nu + \frac{3}{2})}{x \Gamma(\nu + 1)} - \frac{\pi^{1/2}(2\nu + 1)t}{x^2} F \left( \frac{1}{2} - \nu, \frac{1}{2}, \frac{3}{2}; \frac{t^2}{x^2} \right).\]

These formulas have been reproduced as formulas (12) and (13) on p. 123 of [1], and accordingly the same corrections are applicable therein.

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On p. 250, Eq. 11.5(17), which is Rodrigues' formula for the associated Legendre functions, should end with $(1 - x^2)^m$ instead of $(1 - x^2)^n$.

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The following necessary typographical corrections have been noted.

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Furthermore, on p. 86, line 1 delete a, and on p. 229, line 9 delete n. On p. 93, line 7 in the right member of the equation read \( I_{\nu} \). Similarly, on p. 250, line 7 read \( 2^{n/2}He_n(x\sqrt{2}) \). On p. 471, line -7 read \( 2^\tau=0 \); in line -4 read
\[
\Sigma_{n=0}^\infty ((-1)^n(n + l)!/(n - l)!(2l)!(2\sin x)^{2l})
\]
and on p. 493, line -10 read \( e_n \).

It should also be noted that the formula on p. 28, line -3 is incorrect.

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On p. 132, the right side of the last formula should read (in part):
\[
\frac{1}{2} + \pi^{1/2}x^{-1} \frac{\Gamma(\nu + 1)}{\Gamma\left(\frac{\nu + 1}{2}\right)} \left(1 - \frac{t^2}{x^2}\right)^{-1/2}, \quad 0 < t < x < \pi.
\]

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On p. 12 formula 115.01 gives expressions for $F(\theta \pm i\phi, k)$ and $E(\theta \pm i\phi, k)$ in terms of $F(\beta, k)$, $E(\beta, k)$, $F(A, k')$, and $E(A, k')$ with real arguments. However, the amplitudes $A$ and $\beta$ of the latter integrals are defined implicitly in terms of $\theta$ and $\phi$. Explicit expressions for these quantities are:

$$
\sin \beta = 2 \sin \theta \left[ \left( (1 + k \sin \theta \cosh \phi)^2 + (k \cos \theta \sinh \phi)^2 \right)^{1/2} \right.
$$

$$
+ \left. \left[ (1 - k \sin \theta \cosh \phi)^2 + (k \cos \theta \sinh \phi)^2 \right]^{1/2} \right\}^{-1},
$$

$$
\sin A = \tanh \phi / (1 - k^2 \sin^2 \beta)^{1/2}.
$$

On p. 39 the sections referenced in the footnote should be those numbered 813 and 814, and in Section 164.02 the left side of the last equation should read $\Pi(\phi, a_1^2, k_1)$.

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EDITORIAL NOTE: For previous notices of errata in this handbook see Math. Comp., v. 26, 1972, p. 597, MTE 488 and the editorial footnote thereto.
P. 948: In formula 8.375(1) the summation symbol $\Sigma'$ should be used in order to indicate that only one-half the last term is to be taken. An alternative form of this sum is

$$-2 \sum_{k=0}^{E(q/2)-1} \cos \frac{p(2k+1)\pi}{q} \ln \frac{(2k+1)\pi}{q}.$$  

The same error occurs in the source [2] of this formula. As noted in MTE 428 (Math. Comp., v. 22, 1968, pp. 903–907), the range of $p$ should be 1, 2, 3, . . . , $q - 1$. Also, the reference following this formula should be to 8.363(5)–(7).

P. 1020: In formula 8.835(3) the algebraic sign between the terms on the right side should be minus instead of plus.

P. 1067: In formula 9.254(2) a minus sign should be prefixed to the right side.

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Page 3: The second term on the right side of Eq. 7 should be

$$+ \frac{a \cdot b}{c \cdot 1!} z.$$  

Page 16: In Eq. 49 the numerator of the right member should read $2\sqrt{\rho_n}$ , and in Eq. 51 the numerator of the third term on the right side should be 2 instead of 3.

Page 20: In lines 2 and 6 replace $k$ and $k'$ by $K$ and $K'$; also in the formulas on lines 3 and 7.

An errata sheet distributed to the original recipients of this report gave the following typographical corrections:

Page 4, line 9: Read “relations” for “reactions.”

Page 10, line 11: Read, in part, “ . . . $K(k)$ when $k$ is outside the unit circle.”

Page 15, Eq. 46: Read $\phi_i$ for $\phi$.

Page 23, line −2: Read $w = \frac{1}{2} + iy$.

Page 24, line 5: Read $\tau$-plane instead of -plane.

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On p. 289, the first equation should read:

\[
\frac{\Gamma(a)\Gamma(b)}{\Gamma(c)} F(a, b; c; z) = \frac{\Gamma(a)\Gamma(b - a)}{\Gamma(c - a)} (-z)^{-a} F(a, 1 - c + a; 1 - b + a; z^{-1}) + \frac{\Gamma(b)\Gamma(a - b)}{\Gamma(c - b)} (-z)^{-b} F(b, 1 - c + b; 1 - a + b; z^{-1}).
\]

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The correction noted in MTE 557 and MTE 559 (*Math. Comp.*, v. 33, 1979, pp. 430–431) should also be made in formula 911.01 of this handbook. The correct expansion for \( \text{sn}^2 \) can be obtained by differentiating formula 905.01, and, as noted by O. G. Ruehr (*SIAM Rev.*, v. 22, 1980, p. 234), is given in [1] (p. 25, formula 2.23) and in [2] (Section 22.735, Ex. 5).

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On page 304, lines 9 and 10, for

\[
\frac{(x - b)\theta (x - c)^\nu \cdots (x - l)^\lambda}{(a - b)\theta (a - c)^\nu \cdots (a - l)^\lambda} = \sum_{s=0}^{a-1} \left[ \sum_{j=s}^{a-1} \frac{(x - b)^\theta (x - c)^\nu \cdots (x - l)^\lambda}{s! (j - s)! (x - a)^{a-j}} \right] f^{(s)}(a)
\]

read

\[
(x - a)^\alpha (x - b)\theta (x - c)^\nu \cdots (x - l)^\lambda.
\]
Lines 7 and 8 are also incorrect, because the author overlooked the need for the expansions of $1/(z - b)^\beta$, $1/(z - c)^\gamma$, \ldots, $1/(z - l)^\lambda$ in powers of $z - a$ to be combined with the expansion of $f(z)/(x - z)$ in order to obtain the coefficient of $(z - a)^{a-1}$. The original derivation [1] by Hermite of his osculatory interpolation formula does not have this error.

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1. \textit{J. Reine Angew. Math.}, v. 84, 1878, pp. 70–79.


On p. 371 formula 3.624(6) is valid only for integer values of $a$. This restriction is not stated.

For all real values of $a$ the appropriate formula is

$$\int_0^{\pi/2} \left( \frac{\sin ax}{\sin x} \right)^2 dx = \frac{\pi a}{2} + \frac{1}{2} \sin \alpha \left[ 1 + a \left( \frac{a}{2} \right) - x \left( \frac{1 + a}{2} \right) \right],$$

where $\psi(z) = d \ln \Gamma(z)/dz$.

For a derivation of this result, see [1].

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