TABLE ERRATA


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

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

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

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

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

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

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 \((1 - x^2)^m\).

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The following necessary typographical corrections have been noted.
<table>
<thead>
<tr>
<th>page</th>
<th>line</th>
<th>for</th>
<th>read</th>
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<tbody>
<tr>
<td>92</td>
<td>9</td>
<td>α</td>
<td>α</td>
</tr>
<tr>
<td>99</td>
<td>5</td>
<td>$b^{-\nu}$</td>
<td>$b^{-\nu}$</td>
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<td>-7</td>
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<td>3.13.1</td>
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<td>)$_{x}$</td>
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<td>$t$</td>
<td>$x$</td>
</tr>
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<td>4</td>
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<td>$\sqrt{\frac{\pi}{2} a^{1/2}}$</td>
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<tr>
<td>356</td>
<td>-1</td>
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<td>$n$</td>
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</table>

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 $\Sigma_{n=0}^{\infty}$; in line -4 read

$$
\frac{\pi}{2}((-1)^{l}(n + l)!/(n − l)!(2l)!)(2 \sin x)^{2l};
$$

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):

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

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EDITORIAL NOTE: For notices of additional errors in this and earlier editions, see Math. Comp., v. 34, 1980, p. 332, MTE 569 and the editorial footnote thereto.


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.


Further corrections required in this edition are the following:

P. xxxii: The lower limit of the integral defining \( E_n(z) \) should be 1 instead of 0.

P. 34: Delete \( x \) from the second cosine term on the right side of formula 1.395(1).

P. 367: In formula 3.614 the conditions on the parameters should read \( 0 < b < a < 1, p = 1, 2, 3, \ldots \) (In the source [1] of this formula, the relative size of \( a \) and \( b \) is not specified.) The alternative formula

\[
\int_{0}^{\pi} \frac{\sin x \sin px \, dx}{\left( a^2 - 2ab \cos x + b^2 \right) \left( 1 - 2a^p \cos px + a^{2p} \right)} = \frac{\pi a^{p-1}}{2b(b^p - a^{2p})}
\]

holds in the less restrictive range \( 0 < a < 1, a^2 < b, p = 1, 2, 3, \ldots \).

P. 384: In the right member of formula 3.666(1), read \( (\beta^2 - 1)^{\mu/2} \) in place of \( (z^2 - 1)^{\mu/2} \).

P. 908: The right member of formula 8.128(3) should read \( k[K(k) + iK'(k)] \), and all three formulas in 8.128 should carry the restriction \( \text{Im}(k) < 0 \).

P. 929: In formula 8.241(1), for \( x > 1 \) read \( x < 1 \).

P. 944: In formula 8.363(6) the second term on the right side should be \( -\ln(2q) \).
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

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

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 $1, 2, 3, \ldots, q - 1$. 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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EDITORIAL NOTE: For previous notices of errata in this edition see Math. Comp., v. 33, 1979, p. 1377, MTE 565 and the editorial footnote thereto.

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

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

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 $\phi_1$ 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 \(sn^2\) 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

\[
\frac{(x - b)\beta(x - c)\cdots(x - l)}{(a - b)\beta(a - c)\cdots(a - l)}
\]

\[
\cdot \left[ f(a) + f'(a)(x - a) + \frac{1}{2!} f''(a)(x - a)^2 + \cdots + \frac{1}{(a - 1)!} f^{(a-1)}(a)(x - a)^{a-1} \right],
\]

read

\[
(x - a)^\alpha(x - b)^\beta(x - c)^\gamma \cdots (x - l)^\lambda
\]

\[
\cdot \sum_{s=0}^{a-1} \sum_{j=s}^{a-1} \left[ \frac{(x - b)^\beta(x - c)^\gamma \cdots (x - l)^\lambda}{s! (j - s)! (x - a)^{a-j}} \right] f^{(s)}(a).
\]
Lines 7 and 8 are also incorrect, because the author overlooked the need for the expansions of $1/(z - b)^\alpha$, $1/(z - c)^\gamma$, \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 $(z - a)^\alpha - 1$. The original derivation [1] by Hermite of his osculatory interpolation formula does not have this error.

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1. 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

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

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

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

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