TABLE ERRATA


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

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

The right side of formula 54 corresponding to $0 < x < t < \pi$ should read $-1/\pi^{1/2}$ instead of $-(1/2 + \nu)/\pi^{1/2}$. 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

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

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 $(1 - x^2)^n$ instead of $(1 - x^2)^m$.

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The following necessary typographical corrections have been noted.
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 $I_x$. Similarly, on p. 250, line 7 read $2n!/2He_n(x\sqrt{2})$. On p. 471, line 7 read $2\pi^2$; in line 4 read
\[\sum_{l=0}^n(-1)^l(n+l)!/(n-l)!/(2l)!(2\sin x)^{2l};\]
and on p. 493, line -10 read $\epsilon_n$.

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

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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:

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

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

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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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

$$
\int_0^\pi \frac{\sin x \sin px \, dx}{(a^2 - 2ab \cos x + b^2)(1 - 2a^p \cos px + a^{2p})} = \frac{\pi a^{p-1}}{2b(b^p - a^{2p})}
$$

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 $(\beta^2 - 1)^{\nu/2}$ 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 $-\text{ln}(2q)$.

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P. 948: In formula 8.375(1) the summation symbol Σ' 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

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

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, \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

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

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 \( \tau \)-plane.

HENRY E. FETTIS

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

\[
\frac{(x-b)^\theta(x-c)^\gamma \cdots (x-l)^\lambda}{(a-b)^\theta(a-c)^\gamma \cdots (a-l)^\lambda}
\]

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

\[
+ \cdots + \frac{1}{(a-1)!} f^{(a-1)}(a)(x - a)^{a-1} \right].
\]

read

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

\[
\cdot \sum_{s=0}^{a-1} \left[ \sum_{j=s}^{a-1} \frac{(x-b)^\theta(x-c)^\gamma \cdots (x-l)^\lambda}{s!(j-s)!}(x-a)^{a-j} \right] f^{(s)}(a).
\]
Lines 7 and 8 are also incorrect, because the author overlooked the need for the expansions of $1/(z - b)^\beta$, $1/(z - c)^\gamma$, $\ldots$, $1/(z - l)^\lambda$ in powers of $z - a$ to be combined with the expansion of $f(z)/(x - z)$ in order to obtain the coefficient of $(z - a)^{\alpha - 1}$. 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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