Special Functions. An Introduction to the Classical Functions of Mathematical Physics

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Errata and Comments

1. Page ix, section number 11.4.2 should read: “Asymptotic Expansion; $\mu$ Fixed, $\xi$ Large, 302”
2. Page ix, section number 11.4.3 should read: “Asymptotic Expansion; $\xi$ Large, $\mu$ Arbitrary, 303”
3. Page 4, Equation (1.11): include $n > 0$.
4. Page 5, Line 4 and 5: For a proof that the tangent numbers are integers, observe that $y(z) = \tan z$ satisfies the differential equation $y' = 1 + y^2$; hence all derivatives of $y$ at $z = 0$ are integers.
6. Page 17, Theorem 1.4: include $(-1)^{k-1}$ in the expression for $R_k$.
7. Page 18, Line 4: include $(x)$ in the $k$th derivative of $f$.
9. Page 38, Line 9: “Chapter 10” should read “Chapter 9”.
10. Page 43, Section 3.2, Line 6-9: ... is analytic in the half-plane $\Re z > -1$ with 0 excluded. The question about the nature of the singularity at 0 is answered as follows: from $\Gamma(z) = \Gamma(z+1)/z$ and $\Gamma(1) = 1$ we see that the origin is a pole of first order.
11. Page 45, Section 3.2.3, Line 7: read $\frac{1}{2}\Gamma(p)$.
12. Page 49, Line 2 from the bottom: $/q$ should read $/\pi$.
13. Page 49, Bottom line: in the first fraction, the numerator should read $\pi$ and not $q$.
15. Page 52, Lines 8 and 9: The product sign must be moved to the numerator of the subsequent fraction (both in Line 8 and Line 9).

16. Page 52, Line -1: in the numerator of the middle part replace \((mn/e)^n\) by \((mn/e)^{\infty}\).

17. Page 71, Line -8: the summation should start with \(n = 1\).

18. Page 74, 3.9: replace \(e^{-n|\psi|}\) by \(e^{-n|\psi|/2}\).

19. Page 74, Bottom line: in the first fraction, the denominator should read \(\pi\) and not \(q\).

20. Page 76, Line -3: replace “for a start” by “for convergence”.

21. Page 77, Line 5: replace \(\Re z > 0\) by \(0 < \Re z < 1\).

22. Page 80, Line 12: \(u(u, y, z, t)\) should read \(u(x, y, z, t)\).

23. Page 98, Bottom line: insert “=” after the sum.

24. Page 103, Equation(4.41) and in the second line below this equation: replace \(\tau\) by \(t\).

25. Page 131, Exercise 5.11: read \(n = 0, 1, 2, \ldots\).

26. Page 142, Line 4: read \(A\) and \(B\) do not...”.

27. Page 151, include the factor \(2\pi i\) in the denominator in front of the integral.

28. Page 152, Equation (6.39), denominator of the third line: Replace \(2^k\) by \(2^\nu\).

29. Page 159, Line 2: replace “It is easily verified that” by “Introducing in (6.55) the new variable of integration \(u = 1 - e^{-1}\), we easily verify that”.

30. Page 170, Exercise 6.18, the subscript in the Laguerre polynomial in the sum should read \(k\) and not \(n\).

31. Page 171, Bottom, replace the \(~\) by “=” (two times) and include +\(o(1)\) after the sine and cosine terms.

32. Page 173, Line before (7.7): \(\text{Rec}\) should read \(\Re c\).

33. Page 180, Line 2 after (7.23): include \(\frac{1}{\phi}\) in front of the \(M\)-function and \(\frac{1}{\psi}\) in front of the \(U\)-function.

34. Page 186, In subsection 7.3.8, Line 4: replace \(\exp(iz)\) by \(\exp(-iz)\).

35. Page 186, Middle, point 7.1: “Buchholtz” should read “Buchholz”; the same correction is needed in the Index on page 366.

36. Page 190, Line 4: \(z^s\) should be \(z^{-s}\).

37. Page 201, Equation (8.33): lower limit of integration should read \(-1\).

38. Page 222, Equation (9.6), second formula: replace the fraction \(\frac{1}{2\pi\nu}\) by \(\frac{1}{2\pi}\).


40. Page 236, Equation (9.44): \((2/z)\nu\) should read \((2z)^{-\nu}\). The result holds for \(\Re z > 0\) and \(\Re \nu > -1/2\).

41. Page 236, Line after (9.44): “(6.12)” should read “(7.12)”.

42. Page 247, Line 2 from bottom: “(3.13) and (3.14)” should read “(4.13) and (4.14)”.

43. Page 253, Line 6 from bottom: “Remark 9.2” should read “Remark 9.4”.

44. Page 255, Lines 7 and 8: replace the \(~\) by “=” (two times) and write \([\cos(\zeta - \pi/4) + o(1)]\) and \([\sin(\zeta - \pi/4) + o(1)]\) for the cosine and sine terms.

45. Page 260, Line 6 from bottom: \(F_{\phi}\) should read \((rF_{\phi})\).
46. Page 273, Exercise 10.3. Replace the words “current density” by ”charge density” (two times).

47. Page 279, Line 4 after (11.9). Replace |a/z| by |z/a|.

48. Page 283, $t$–integral: include $0 < c < \lambda$.

49. Page 284, Line before (11.21): “non-negative” should read “non-positive”.

50. Page 285, Line -5: write $u(t) = -i(t - 1)$.

51. Page 289, Line before §11.3.1: “§11.3.6.” should read “§11.3.4”.

52. Page 298, Equation (11.60). Replace $\pi$ by $2\pi$ (two times).

53. Page 301, Line before Equation (11.71). Replace $s = 1$ by $t = 1$.

54. Page 304, Equation (11.81). Replace sinh, by sinh $\gamma$.

55. Page 315, Equation (12.1): $0 \leq k < 1$.

56. Page 315, Equation (12.2): $0 \leq k \leq 1$.

57. Page 321, Equations (12.15), (12.16), (12.17): $\phi$ should be restricted to the interval $[-\pi/2, \pi/2]$ and $k$ as in (12.1) and (12.2). After (12.20) insert: “If $n > 0$ and $x^2n > 1$ the integral in (12.20) should be interpreted as a Cauchy principal value integral.”

58. Page 325, Line -5, series for $\theta_1$: the exponential function should read $e^{2nix}$.

59. Page 346, Eq. (13.13): replace $\frac{1}{4}$ by $\frac{1}{2}$.
