ERRATA AND ADDITIONS: *SECOND EDITION*

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COMPLEX VARIABLES, INTRODUCTION AND APPLICATIONS

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Corrections and small additions

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p. 4 line 8 from top: after " ..by arg z." add "We take the standard convention, counter-clockwise is the positive direction."

p.7 Problem 2c, replace: $\cos(z) = (e^{iz} + e^{-iz})/(2)$ by $\cos z = (e^{iz} + e^{-iz})/2$

p.8 Problem 4. Spelling: change: "Estabilish" to "Establish"

p.33 16 lines from top: eliminate "exist and"; now reads: "...must be differentiable.."

p.34: line 4 from top: eliminate "after noting Eq. (2.1.2) and manipulating." and replace "$|\Delta z|$ approaching zero" by "$|\Delta x|, |\Delta y|$ approaching zero".

p.39 In Example 2.1.6, 1st line after equations replace "$\psi(x)$" by "$\psi(y)$"

p.47 line 8 from bottom: just before "The semiaxis.." add "In fact , for $0 < \theta_p < 2\pi, r \neq 0$, the function is analytic (from the Cauchy-Riemann conditions)."

p.48 4 lines from top, replace "On the other hand, if we took.." by "On the other hand we reiterate, if we took..."

p.66 line 11 from top, replace: "Riemann surface with a cut along the positive x-axis." by "Riemann surface on which each sheet connects smoothly."

p.71 lines 8,9 from bottom, replace "..there is a set of points...of the interval." to: "..there is a point $(x(t), y(t))$ that yields the image point $z(t)$.

p.76
line 4 from bottom, after $dz = rie^{i\theta}d\theta$ add: " and since the curve is simple we can take $0 < \theta < 2\pi$
(on same page) line 2 from bottom, replace "any closed curve" by "any simple closed curve"

p.84 2 lines from bottom, replace "over z" by " of $f(z)$ over the simple contour C

p.88 line 10 from top, replace "a small, but finite circle of radius r" by "a small circle of radius $r > 0$

p.98 line 8 from top: after harmonic functions" add: $u = Ref$ or $v = Imf, f = u + iv$,

p.99 In Theorem 2.6.7: change: "…bounded by a simple closed contour C, then at any interior point z" to "…bounded by a simple closed contour C, and if f is continuous on C, then at any interior point z"

p.111
line 6 in proof of Theorem 3.1.1, after "$n > N$," add: "N independent of z"
(on same page) line 8 in proof of Theorem 3.1.1, before "Continuity" add: "Now take an $n > N$."
(on same page) line 10 in proof of Theorem 3.1.1, omit "$n > N$,"; line should now read: "Thus for $|z - z_0| < \delta$"

p.113
Line 3 change: "Theboundedness…" to "The boundedness…"
(on same page) In the two equations following line 3, change: "$|b_1(z)| < B$ hence $|b_n(z)| < BM^{n-1}$" to "$|b_1(z)| \leq B$ hence $|b_n(z)| \leq BM^{n-1}$"
(on same page) line 5 above Problems, after Theorem 3.1.2 add: "(proven in section 3.4)"

p.114 Problem 5b, replace "$R < |Re\ z| \leq 1''$ by "$R < Re\ z \leq 1''$

p.131 line 10 from top: replace equation: $f(z) = \sum_{n=-\infty}^{0} \frac{C_n}{(z-z_0)^n}$ by $f(z) = \sum_{n=0}^{\infty} \frac{C_n}{(z-z_0)^n}$

p.135 Near top of page; in the formula for C_n, change $\frac{1}{2^{n+1}}$ to $\frac{-1}{2^{n+1}}$

p.137 Problem 7; in the formula for $R_n(z)$ change $(-)^{n+1}$ to $(-1)^{n+1}$

p.139
line 1 of Theorem 3.4.3 replace "...$\leq M_j$ in some region R with M_j a sequence of constants." by ""...$\leq M_j$, with each $M_j, j = 1, 2...$ constant, in some region R."

(on same page) last line of proof replace "Theorem 3.1.2 follows." by "Theorem 3.1.3 follows."

p.141

line 6 from top replace "$|\zeta - z| > \nu$" by "$|\zeta - z| \geq \nu$"
(on same page) line 11 from top after "uniformly" add $tof'(z)$ and after "and" add "then employing"
(on same page) line 14 from top eliminate "all"

p.142 line 5 from top before "has no" add: "$x \neq m\pi, m$ integer,"

p.145 Example 3.5.2, first line. Replace: "Describe the singularities of the function " by "Describe the singularity of the function at $z = 0$ "

p.146 Example 3.5.3 The line after the formula, change: "Here the function $f(z)$ has simple poles with strength 1.." to "Here we will show the function $f(z)$ has simple poles with strength -1.."

p.148

3 lines above Eq. (3.5.5) after "... ...$f(z) \to 0$ as $r \to 0$." add: "Also for $\theta = \pm\pi/2, |f(z)| = 1$."
(on same page) 2 lines above Eq. (3.5.5) change "... namely, $r = (1/R)\cos\theta$ (i.e the points..." to "...namely, $r = (1/R)\cos\theta, R \neq 0$, (i.e., the points..."
(on same page) last two lines, change: "Thus $|f(z)|$ may take on any positive value other than zero by the appropriate choice of R" to "Thus $|f(z)|$ may take on any positive value in the neighborhood of $z = 0$".

p. 162 First line; change: "If we assume that $|a_k(z)| \leq M_k$... " to "If we assume that $|a_k(z)| < M_k$..."

p.181

In Theorem 3.7.3: change: "... simply connected domain D, then the linear..." to "... simply connected domain D containing z_0, then the linear..."

p.185

line after Eq. (3.7.41), before: "($z = 0$ can be translated to $z = z_0$ if we wish) insert: "$z \neq 0, \omega_{m,n}$"
(on same page) line after Eq. (3.7.43), before "The function ..." insert: "Alternatively, by

taking the derivative of Eq.(3.7.42) w satisfies "$w'' = 6w^2 - \frac{g_2}{2}$".

p.186 line immediately after Eq. (3.7.45) insert (no new paragraph): "Also note that w_1 satisfies the second order ODE $w_1'' = 2k^2 w_1^3 - (1+k^2)w_1$."

p.198 2nd line above Example 3.8.2 change "... time T with ..." to "... distance with ..."

p.206 3rd line from bottom change "... lying in D." by "...lying in D and enclosing z_0."

p.240 after $z = z_0 + \epsilon e^{i\theta}$ insert: " and taking θ from 0 to ϕ,

p.257 Problem 14, 3rd line, change: "... where C_R is the ..." to "... where C_R is the outside part of the ..."

p.258 Problem 14, part (c): left hand side add dx in the integrand; change the sign of the right hand side: from "$= \pi b_{n+2}$" to "$= -\pi b_{n+2}$"

p.266 problem 6. Change the last two lines from: "Consider the two functions $-f_0$ and $f(z) - f_0$, and use ... to deduce that $f(z) = f_0$." to: "Consider the two functions $-f_0$ and $f(z)$. Then Rouché's Theorem implies that the functions $-f_0, f(z) - f_0$ have the same number of zeroes.

p.268
line 10-11 from top, omit: "(sometimes referred to as bounded mean oscillations (BMO))";
(on same page) line 12 from top, omit "(i.e. in BMO)"

p.270 In the right hand side of of eq. (4.5.10) replace $\delta(x - x_0)$ by $\Delta(x - x_0; \epsilon)$

p.272
In eq. (4.5.17) 2nd line replace $e^{ikx'} g(x')$ by $e^{-ikx'} g(x')$
(on same page) 2 lines after eq. (4.5.18) replace $f(x) = \delta(x - x')$ by $f(x) = \delta(x)$

p.329 line 8 from top before "(See also...)." add "Note, in the above Eq. when $x^2 + y^2 \to 1$, for $y > 0, y < 0$, $\tan^{-1}[\cdot] \to 0, \pi$ respectively."

p.341
line 10 from bottom replace "one value for $g(z) = w - w_0 = a$ corresponding to every z inside" to "one value z for which $g(z) = w - w_0 = a$ inside"
(on same page) replace 'Rouche" by "Rouché" everywhere

p.342

line 14 from bottom replace "$< \epsilon_1$ and therefore $F(w)$ is continuous." by "$< \epsilon_1$. Now let δ_1 be small enough so that $|w - w_1| < \delta_1$ is in P and $|F(w) - F(w_1)| < \epsilon_1$. Since ϵ_1 is arbitrary and there is a corresponding $\delta_1 > 0$, therefore $F(w)$ is continuous."
(on same page) line 6 from bottom after "only one solution" add " counting multiplicity"

p.343 line 4 in proof replace "to an arbitrary point $z_0 \in D$ and is not a point ..." to "to a point $z_0 \in D$ which is not a point ..."

p.401 line 6 from bottom in the equation for $g(z) + 1$ replace $(z \cdot z_2)^3$ by $(z - z_2)^3$

p.426 In Example 6.2.4 replace $e^{-\frac{t}{k}}$ by $e^{-\frac{t}{\epsilon}}$

p.463 In Example 6.4.5 line above first set off equation: replace $y \to \pm i\pi$ by $y \to \pm\pi$

p.471 In two places on the page (middle of the page and after formulae for $I_1(k)$) spelling correction: change "principle value" to "principal value"

p.515 in Eq. (7.1.8) replace $z - t$ by $t - z$ in the denominator of the integral

p.520 line 4 from bottom replace $t \to \pm\infty$ by $\tau \to \pm\infty$

p.522 line below Eq. (7.2.16) replace "part **1** " by "part 1" –i.e. eliminate bold on 1.

p.529 line 2 from bottom replace "$g(t)$ is κ" by "$g(t)$ is $\kappa \neq 0$"

p.528 line 1 of Example 7.3.1 replace "inside a closed contour" by "inside a simple closed contour"

p.563 First equation in 2nd paragraph for $\Phi(k)$. Inside integral (add a left parens.): change $\frac{f(l)}{X^+(l)l-k)}$ to $\frac{f(l)}{X^+(l)(l-k)}$

p.606 line 5 from bottom replace $\mathbf{g} \to \hat{\mathbf{f}}$ and $\to \hat{\mathbf{h}}$ by $g \to \hat{g}$ and $h \to \hat{h}$ –note: no boldface necessary.

p. 619 in the equation 3 lines below equation (7.7.26b) replace

$\boldsymbol{\Psi}_\mathbf{1} \sim (\frac{1}{k})^\theta$ by $\boldsymbol{\Psi}_\mathbf{1} \sim (\frac{1}{k})^\theta \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

p.630 In the solution 3b, move parentheses: from left of summation to just inside summation; i.e. from $(\Sigma_{n=0}^{\infty}$... to $\Sigma_{n=0}^{\infty}($...

p.640 index: omit reference to ‘BMO (bounded mean oscillations), 268”