Mathematical Physics: Applied Mathematics for Scientists and Engineers
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ERRATA LIST

p. 10 Change Equation 1.48 to read:

$$\left|\overline{\mathbf{C}}\right| = |\mathbf{A}|\,|\mathbf{B}| \sin\theta, \tag{1.48}$$

p. 16

(i) Exercise 2, first equation, change c, j to i, j:

$$M_{i,j} = ij^2 \quad \text{for} \quad i, j = 1, 2, 3,$$

(ii) Exercise 4, first line, change "row matrix" to "column matrix".

(iii) Exercise 4, first equation, change equation to read:

$$\left[[D][V]\right]^{\dagger} = [V]^{\dagger}[D]$$

p. 49 Change Equation 3.14 to read:

$$\overline{\mathbf{r}} = (\overline{\mathbf{r}} \cdot \hat{\mathbf{e}}_r)\hat{\mathbf{e}}_r + (\overline{\mathbf{r}} \cdot \hat{\mathbf{e}}_\theta)\hat{\mathbf{e}}_\theta + (\overline{\mathbf{r}} \cdot \hat{\mathbf{e}}_\phi)\hat{\mathbf{e}}_\phi. \tag{3.14}$$

p. 64 Exercise 20, change equation to read:

$$\overline{\mathbf{B}} = B_o \hat{\mathbf{q}}_z.$$

p. 65 Exercise 20, change equation to read:

$$\overline{\mathbf{B}} = \frac{B_o \rho}{\rho_o} \hat{\mathbf{q}}_\phi,$$

p. 75 Change Equation 4.45 to read:

$$\hat{\mathbf{e}}_i' = a_{ij}\hat{\mathbf{e}}_j. \tag{4.45}$$

p. 133 Exercise 25, first line, change $\rho_c(x, y, y)$ to $\rho_c(x, y, z)$.

p. 152 In all equations on the page, change $\underline{c}_n$ to c_n, i.e.,

$$f(x) = \sum_{n=0}^{\infty} c_n(x - x_o)^n = c_o + c_1(x - x_o) + c_2(x - x_o)^2 + \cdots . \tag{6.96}$$

$$c_n = \frac{1}{n!}\frac{d^n f(x)}{dx^n}\bigg|_{x=x_o} \tag{6.97}$$

$$\lim_{n\to\infty}\left|\frac{c_n(x - x_o)^n}{c_{n-1}(x - x_o)^{n-1}}\right| < 1. \tag{6.98}$$

$$\begin{aligned} f(x) &= \sum_{n=-\infty}^{+\infty} c_n(x - x_o)^n \qquad (6.99)\\ &= \cdots + \frac{c_{-2}}{(x - x_o)^2} + \frac{c_{-1}}{(x - x_o)} + c_o + c_1(x - x_o) + c_2(x - x_o)^2 + \cdots . \end{aligned}$$

p. 162 Paragraph below Equation 6.135,

(i) third line, change C_1 to C_2 and C_2 to C_1.

(ii) seventh line, change C_2 to C_1.

p. 215 Exercise 49. (b), change $y = 1/2$ to $u = 1/2$.

p. 216 Exercise 55, change the sentences beginning in the second line of the paragraph to the end of the paragraph to read:

Integrate to obtain $\underline{z} = \underline{z}(\underline{w})$.

p. 241 Change Equation 7.90 to read:

$$f_k = \sum_{n=n_o}^{2N+n_o-1} \underline{c}_n e^{i\omega_n t_k} \tag{7.90}$$

p. 242 Change the first line of Equation 7.92 to read:

$$f_k = \sum_{n=-N}^{N-1} \underline{c}_n e^{i\omega_n t_k}$$

p. 300 Exercise 21:

(i) Change the last sentence of the first paragraph to read:
"Show that the conditions for closure with zero contribution are different for a real, definite integral than they are for a Fourier inversion."

(ii) Change the first equation to read:

$$F(\omega) = \frac{\omega^2}{\omega^3 + i}$$

(iii) Change the equation under (b) to read:

$$f(t) = \int_{-\infty}^{\infty} dx\, e^{i\omega t} F(\omega)$$

p. 316 Figure 9.14, change the label on the abscissa from "imag" to "real".

p. 318 Figure 9.16, change the label on the abscissa from "imag" to "real".

p. 354 Change the part of the sentence below Equation 10.104 to read:

"... where the c_n are unknown coefficents, and s is a fixed number, not necessarily an integer or pure real. Often, however, it is a positive or negative integer."

p. 379 Figure 10.16, change –K x(t) to read $-K_o$ x(t).

p. 383 Title of Figure 10.21, change "Principal" to "Principle".

p. 408 Exercise 22 (a), last line, change $x = x_o$ to $y = y_o$.

p. 421 Exercise 53, first line below the equation, change $a(x), b(x)$ to $p(x), q(x)$.

p. 422 Exercise 54 (d), first line, change $d(t)$ to $d(x)$.

p. 428 Change Equation 11.20 to read:

$$\sum_m \sum_n \left\{ \begin{array}{l} A_{mn} e^{+x\sqrt{c_{nx}}} e^{+y\sqrt{c_{my}}} e^{+z\sqrt{-c_{nx}-c_{my}}} \\ +B_{mn} e^{-x\sqrt{c_{nx}}} e^{+y\sqrt{c_{my}}} e^{+z\sqrt{-c_{nx}-c_{my}}} \\ +C_{mn} e^{+x\sqrt{c_{nx}}} e^{-y\sqrt{c_{my}}} e^{+z\sqrt{-c_{nx}-c_{my}}} \\ +D_{mn} e^{-x\sqrt{c_{nx}}} e^{-y\sqrt{c_{my}}} e^{+z\sqrt{-c_{nx}-c_{my}}} \\ +E_{mn} e^{+x\sqrt{c_{nx}}} e^{+y\sqrt{c_{my}}} e^{-z\sqrt{-c_{nx}-c_{my}}} \\ +F_{mn} e^{-x\sqrt{c_{nx}}} e^{+y\sqrt{c_{my}}} e^{-z\sqrt{-c_{nx}-c_{my}}} \\ +G_{mn} e^{+x\sqrt{c_{nx}}} e^{-y\sqrt{c_{my}}} e^{-z\sqrt{-c_{nx}-c_{my}}} \\ +H_{mn} e^{-x\sqrt{c_{nx}}} e^{-y\sqrt{c_{my}}} e^{-z\sqrt{-c_{nx}-c_{my}}} \end{array} \right\}. \qquad (11.20)$$

p. 448 Split the last sentence of the paragraph ***Orthogonality Relations*** into two sentences:

... eigenfunction problem.

A Hermitian operator can then be identified and the orthogonality properties of the eigenfunctions determined.

p. 449 Change Equation 11.111 to read:

$$\left[J_\nu(\alpha_{\nu n}\rho/r_o)\rho\frac{dJ_\nu(\alpha_{\nu m}\rho/r_o}{d\rho}\right]\Bigg|_\Omega = 0. \tag{11.111}$$

p. 453 Change Equation 11.136 to read:

$$\Phi(\rho,\theta,z) = \sum_\nu \sum_k \begin{Bmatrix}\cos(\nu\theta)\\ \sin(\nu\theta)\end{Bmatrix} \begin{Bmatrix}\cos(kz)\\ \sin(kz)\end{Bmatrix} \begin{Bmatrix} I_\nu(k\rho)\\ K_\nu(k\rho)\end{Bmatrix} \tag{11.136}$$

p. 462 Change Equation 11.176 to read:

$$\grave{A}_\ell(x) = \cdots + a_{n\gg 1}\{x^{n+1} + x^{n+2} + x^{n+4} + \cdots\} \tag{11.176}$$

p. 463

(i) Line above Equation 11.180, change $B_\ell(x)$ to $\grave{B}_\ell(x)$.

(ii) Line above Equation 11.181, change $A_0(x)$ to $\grave{A}_0(x)$.

p. 464 Third paragraph, change "six" to "five".

p. 473 Figure 11.21, last line of equation, change $+V_0$ to $-V_0$.

p. 474 Equation 11.237: replace closing brace by opening brace:

$$\Phi(r,\theta,\phi) = \sum_{\ell=0}^{\infty}\sum_{m=-\ell}^{+\ell}\begin{Bmatrix} r^\ell \\ r^{-\ell-1}\end{Bmatrix}\begin{Bmatrix}\underline{Y}_{\ell m}(\theta,\phi).\end{Bmatrix} \tag{11.237}$$

p. 482 Exercise 16(a), change Equation to read:

$$z(\rho) = \int_o^{r_o} d\xi\, F(\xi)g(\rho \mid \xi).$$

p. 484 Exercise 24, change the second and third line below the first equation to read:

"... the differential equation for radially dependent component becomes"

p. 489 Exercise 34: insert 0 on the right-hand side of Laplace's equation in two dimensions:

$$\nabla^2\Psi(q_1,q_2) = \frac{1}{h_1h_2}\left[\frac{\partial}{\partial q_1}\frac{h_2}{h_1}\frac{\partial}{\partial q_1} + \frac{\partial}{\partial q_2}\frac{h_2}{h_1}\frac{\partial}{\partial q_2}\right]\Psi(q_1,q_2) = 0,$$

p. 507 Exercise 7, change equation to read:

$$\psi(x) = x - \int_0^x dt\,(t-x)\psi(t).$$

p. 508 Exercise 12.i., change equation to read:

$$\psi(x) = \lambda\int_{-1}^{1} dt\,(x-t)^2\psi(t).$$

p. 537 First line of the paragraph above Equation 13.45, change sentence to read: "We should also look carefully at the little circular part..."

p. 542

(i) Second line from top of page, change term to read $d\underline{z} = e^{i2\pi}dr$.

(ii) Change Equation 13.57 to read:

$$\oint_{C_o} = 2\pi = \int_1 + \int_3 = 2I. \tag{13.57}$$

p. 547 Change Equation 13.72 to read:

$$\frac{\partial u}{\partial x} + i\frac{\partial v}{\partial x} = \frac{\partial \underline{w}}{\partial x} = \frac{\partial \underline{w}}{\partial \underline{z}} = 0 \qquad \text{at the saddle points.} \tag{13.72}$$

p. 581 Change Equation 14.100 to read:

$$= t^i_j\frac{\partial}{\partial x_j}, \tag{14.100}$$

p. 593 Exercise 3, change equation to read:

$$\overline{\overline{\mathbf{M}}} = M_{ij}\hat{\mathbf{g}}^i\hat{\mathbf{g}}^j = M^{ij}\hat{\mathbf{g}}_i\hat{\mathbf{g}}_j.$$

p. 611 In the first line of the paragraph above Table 15.16, change "are shown" to "is shown".

p. 614 In the fourth line from the top of the second paragraph, change "dimension" to "dimensions".

p. 619 Table 15.25, row $C_4^{[2]}$, column g_4, change "-1" to "$-i$".

p. 623 Change the sentence beginning in the 2nd line of the 2nd paragraph to read:

"The net result is that there is one $D_3^{[1]}$ representation, no $D_3^{[2]}$ representation, and one $D_3^{[3]}$ representation in the block diagonalization."

p. 625 Equation 15.62, change element (1,3) and (3,1) from "1" to "-1".