

# Errata Sheet: *Mathematical Methods and Physical Insights*/Schramm

Page	Line	Correction
20	below Eqn (3.15)	The reference to Section 5 should be Section 5.1
54	below Eqn (6.13a)	In the second line, $\frac{1}{20}$ should be $\frac{1}{10}$
66	Problem 6.3c	$\sum_1^\infty \frac{2n^2+1}{n^\pi}$
77	below Eqn (7.28)	Replace “ $\epsilon = 1$ ” with “ $\epsilon = 0$ ”
84	below Eqn (8.24)	The references should be to integrals (c) and (a)
91	above BTW 8.2	“... it’s helpful have” should be “... it’s helpful to have”
95	Eqn (8.80)	<ul style="list-style-type: none"> <li>• Delete “, <math>s \in \text{Integers}</math>”</li> <li>• Replace “Thus <math>\Gamma(s) = (s-1)!</math>.” with “Thus for integer <math>s</math>, <math>\Gamma(s) = (s-1)!</math>.”</li> </ul>
107	top of page	“...except, of course, at $k = 0$ ” should be “...except, of course, at $x = 0$ ”
115	Prob 9.8	“...any two of the three limit representations...” should be “...any two of the limit representations...”
139	before Eqn (12.29)	should read “Similarly, a vector field $\vec{B}$ with zero divergence...”
147	Fig 12.5	the first plot should be labeled $(a) x\hat{i}$ , without a ‘hat’ over the $x$
155	Eqn (13.3b)	the 2nd equation should be “ $\frac{\partial \Psi}{\partial r} = -\frac{1}{r} \frac{\partial \Psi}{\partial \phi}$ ”
163	above Eqn (14.22)	should be “spanning the first quadrant gives”, and the lower limit on the integral in Eqn (14.22) should be 0
164	sentence be- fore Sec 14.2	change “not not” to “not”
165	Eqn 14.29	$\int_C$ should be $\int_S$
174	Fig 14.3 cap- tion	“(a) $\vec{E} = xy^2\hat{i} + x^2y\hat{j}$ (b) $\vec{B} = x^2y\hat{i} - xy^2\hat{j}$ ” (same as Fig 12.10)
178	last line on page	$dA$ should be $dA'$
204	Eqn (15.29)	left-hand side should be $\int_S \left( \frac{\partial v_y}{\partial x} - \frac{\partial v_x}{\partial y} \right)$
206	Example 15.8	the last integral in the first equation should be $\frac{4}{3} \int_0^1 x^3 dx$

231	before BTW 17.1	replace “it’s functional form” with “its functional form”
33p	Prob 24.1	appended to parts (i) and (j) should be the phrase “with period $T$ .”
355	below Eqn (25.98)	$x_0$ should be $a_0$
357	Eqn (24.24)	both $P_\perp$ ’s should be $\mathcal{P}_\perp$
364	Prob 25.4	the column vector assignments of $ v\rangle$ and $ w\rangle$ should be swapped
365	below Eqn (25.134)	amend “using the” as “using the notation”
395	below Eqn (26.129)	both factors of $1/2$ should be $1/\sqrt{2}$
419	below Eqn (27.78)	“characterisite” should be “characteristic”
440	below Eqn (28.17)	Remove one “by”
452	Prob 28.16	the reference to Eqn (28.34) should be (28.32)
521	Prob 32.23	in Eqn (32.67), $\frac{m}{1-x^2}$ with $\frac{m^2}{1-x^2}$
537	Eqn 34.1c	replace $c_n = \langle \phi_n   f \rangle$ with $c_n = \frac{1}{k_n} \langle \phi_n   f \rangle$
547	Fig. 34.3	horizontal axes should be labeled $x - x'$ , not $x - a$
557	below Eqn 35.36	move the colon leftward $P: \vec{r} \rightarrow \vec{r}'$
569	2nd para- graph	“Though many properties ....” [delete ‘of’]
572	Eqn (36.11)	Replace $\sqrt{a}$ with $a$
591	Eqn (36.97)	Replace $\frac{1}{\sqrt{2\pi}}$ with $\sqrt{\frac{2}{\pi}} \cdot \frac{1}{\sqrt{2\pi}}$
598	Prob 36.9	Replace “Find the...” with “Find expressions for the...”
598	Prob 36.11	part a: Replace $\mathcal{F}$ with $\mathcal{F}^{-1}$
599	Prob 36.16	Replace “and it Fourier transform...” with “and its Fourier transform...”
600	Prob 36.17	Replace $f(x) = e^{-bx}$ with $f(x) = e^{-b x }$

600	Prob 36.19	Replace $\mathbb{1}$ with 1
600	Prob 36.28	In last line, replace $ \tilde{f}(k) ^2$ with $\sqrt{2\pi} \tilde{f}(k) ^2$
601	Prob 36.34	part b: Replace $\tilde{f}(0)$ with $\tilde{f}(k)$
602	Prob 36.42	Delete “in Table 36.4”
603	Prob 36.48a	Replace “ $\lim_{s \rightarrow 0} F(s) = 0$ ” with “ $\lim_{s \rightarrow \infty} F(s) = 0$ ”
629	above Eqn (39.41)	Replace “ $W(t) =$ ” with “ $W(t) \sim$ ”
629	Eqn (39.42)	Replace “ $u_p(t) =$ ” with “ $u_p(t) \sim$ ”
642	Prob 39.18	Replace “ $u(0) = 1, u'(0) = 1$ ” with “ $u(1) = 0, u'(1) = 0$ ”
642-3	Prob 39.19	<ul style="list-style-type: none"> <li>• Replace <math>\varphi + \theta = \pi</math> with <math>\theta - \varphi = \pi</math></li> <li>• part b: Replace “With or a ...” with “With a ...”</li> <li>• delete “[Hint: compare the equations of motion in <math>\varphi</math> and <math>\theta</math>.]”</li> </ul>
643	Prob 39.20	<ul style="list-style-type: none"> <li>• 2nd paragraph: Replace “Notice that if the ...” with “If the...”</li> <li>• part b: Replace “...plots of the solution from ...” with “...plots of the solution for ...”</li> </ul>
657	Prob 40.5	<ul style="list-style-type: none"> <li>• parts b and c: Replace <math>\mathcal{D}^2</math> with <math>-\mathcal{D}^2</math></li> <li>• part c: Delete “, both in integral form and with bra-ket notation, ”</li> </ul>
682	Eqn (41.117)	Replace $\left. \frac{dT}{dt} \right _{r=R}$ with $\left. \frac{\partial T}{\partial n} \right _{r=R}$
684	Eqn (41.127)	Replace $\psi_m$ with $\psi_{jm}$
689	Prob 41.9	Replace “Affixing a mass $m...$ ” with “Affixing a very large mass $m...$ ”
690	Prob 41.15	In last line, replace “of $V(x, y_0, z)$ for different values of $y_0$ ” with “of $V(x, y, z)$ for different values of $z$ ”
690	Prob 41.17	Replace $T(x, 0) = x$ with $T(x, 0) = T_0 x/L$
690	Prob 41.18	Replace $\cos^2 \theta$ with $T_0 \cos^2 \theta$
690	Prob 41.20a	Replace $u'(0) = a$ with $u(0) = a$
690	Prob 41.23	Replace $T(a, y, t) = T_a(y) = y$ with $T(a, y, t) = T_* = T_0 y/b$
690	Prob 41.24	Replace $T(a, y, t) = y$ with $T(a, y, t) = T_0 y/b$ and $T(x, 0, t) = x^2$ with $T(x, 0, t) = T_0 x^2/a^2$

691	Prob 41.25	<ul style="list-style-type: none"> <li>• replace “... determined by the zeros of ...” with “...determined by the zeros <math>\alpha_{jn}</math> of ...”</li> <li>• replace “Which modes are excited...” with “ Which modes <math>(n, j)</math> are excited....”</li> <li>• in parts a, b, c: and <math>n</math>’s in parenthese should be replaced with <math>j</math> — e.g., replace <math>(0, n)</math> with <math>(0, j)</math></li> </ul>
691	Prob 41.27	replace “ the condition on $\Phi...$ ” with “the periodicity of $\Phi...$ ”
692	Prob 41.29	delete part c
699	Eqn (42.31)	the second occurrence of $0 < r < r'$ should be $0 < r' < r$
717	Prob 42.10c	replace (42.55) with (42.57)
718	Prob 42.16	part b: replace “...a driving force $f(x, t) = \sin x \cos 2t.$ ” with “...a driving force $f(x, t) = \sin x \cos 2ct$ for $L = \pi.$ ”
718	Prob 42.17	replace “on BTW 42.1” with “of BTW 42.1”
719	Prob 42.23	“Mathematica’s” not “Mathematic’s”
719	Prob 42.25	replace “Use (2.28) to find $G ...$ ” with “Use images and the fundamental solution to find $G...$ ”
719	Prob 42.26	<ul style="list-style-type: none"> <li>• replace “Find” with “Use the fundamental solution to find”</li> <li>• delete “<math>T(x, 0) = T_0(x)</math>”</li> <li>• replace both <math>a</math> and <math>b</math> with 0</li> </ul>
719	Prob 42.27	replace all $\tau$ ’s with $t$ ’s
719	Prob 42.30	replace $x + c$ with $x/L + c$
719	Prob 42.32	replace $\alpha = 1$ with $\alpha = .01$ ; before $T(0, t) = \cos t$ insert the condition $T_0(x) = e^x$
719-20	Prob 42.33c	replace $\frac{1}{4\pi^2}$ with $-\frac{1}{4\pi^2}$
727	Eqn (43.35)	the exponentials should be added, not subtracted
727	Eqn (43.36)	<ul style="list-style-type: none"> <li>• in the first line: exponentials should be added, not subtracted;</li> <li>• in the second line: replace <math>(-1)^{\ell+1}</math> with <math>(-1)^\ell</math></li> </ul>
727	Prob 43.2	Replace with “... Lippmann-Schwinger equation emerges for a limited-range potential.”
728	Prob 43.3	Replace $(\nabla^2 + \mu^2)G(\vec{r}) = -\delta(\vec{r} - \vec{r}')$ with $(\nabla^2 - \mu^2)G(\vec{r}) = -4\pi\delta(\vec{r})$

728	Prob 43.6a	the right-hand side of the equation should have an overall factor of $i^\ell e^{i\delta_\ell}$
728	Prob 43.6b	Replace “the the” with “the”
748	Table C.2	expression in top right corner: replace $J_{n+1}(x)$ with $J_{n\pm 1}(x)$
751	Eqn (C.27)	replace $\sin(\nu x)$ with $\sin(\nu\pi)$
754	Prob C.4	append to end of sentence “... in (C.2) for $n \geq 0$ .”
755	Prob C.11	replace the expression for $\phi_n(x)$ with “ $\phi_n(x) = \sin(\alpha_{mn}nx/a)$ , where $\alpha_{mn}$ is the $m$ th zero of $\phi_n$ .”
755	Prob C.13	replace “Laplacian” with “Helmholtz equation $(\nabla^2 + k^2)\phi = 0$ .”
755	Prob C.16	the small- $x$ Neumann function $n_\ell$ should have $(2\ell)!$ in the numerator, not $(2^\ell)$