

CORRECTIONS TO A COMPANION

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This first correction page is based on a long and insightful lists from Bob Burckel and Eric Løv. I should also like to thank Marit Sandstad, Norton Starr, Wan-Teh Chang, Silas Davis, Vito Videtta, Daniel Worral Daniel James, Eliya Gwetta, Johan Grundberg, Robin Chapman and Kassra Rashidian for contributions.

Page 13 End of first paragraph. Replace (P4) by (P3).

Page 18 In Theorem 1.42 we do not need the assumption $K \geq 0$.

page 32 In proof of Lemma 3.4 first (*ii'*) should be (*i'*)

Page 45 [A clarification rather than a correction] In Exercise 4.5, (ii), line 2 ‘positive’ for us means ‘non-negative’.

Page 47 In Exercise 4.11 (ii) replace + by – to get

$$\|\mathbf{x} + \mathbf{y}\|^2 - \|\mathbf{x} - \mathbf{y}\|^2.$$

Page 49 In Exercise 4.17 (i) replace ‘closed’ by ‘bounded’.

Page 52 In Exercise 4.27 (iii) replace the self referential (iii) by (ii).

Page 52 In Exercise 4.27 (iv) $\bigcap_{j=1}^{\infty} F_j$ should be $\bigcup_{j=1}^{\infty} F_j$.

Page 55 Line 3, replace $f(\mathbf{x})$ by $f(\mathbf{y})$

Page 55 In Exercise 4.36 replace ‘Lemma 4.29’ by ‘Exercise 4.29’.

Page 69 In Exercise 4.79 (iii) next to last line, replace ‘to to’ by ‘to’.

Page 73 First line of Exercise 5.3 (i). $|a_{n+1}/a_n| < (1 + |l|)/2$.

Page 75 Exercise 5.9 (iii) ‘inequality of Exercise 5.7 (i)’ (not Exercise 5.7 (ii)).

Page 84 First two lines of proof. Replace X_k by E_k and X by E .

Page 85 In line 6, Theorem 5.26 should be Lemma 5.26.

Page 107 In line 21, the second A should be A' . In line 22 the first A' should be A .

Pages 108 and 453 ‘Pierce’ should be ‘Peirce’.

Page 116 Line 6, \mathcal{L} should be \mathbb{L} . Line 8, should say that $\Re z$ is the real part of z . In part (v) we must specify that \mathbb{K} is closed under conjugation (ie $z \in \mathbb{K}$ implies $z^* \in \mathbb{K}$).

Page 118 Second last line of second last paragraph. Replace $h \rightarrow x$ by $h \rightarrow 0$.

Page 121 First formula, second paragraph of part (ii)

$$(\alpha_1 - \alpha_2)\mathbf{h} = \epsilon(\mathbf{h})\|\mathbf{h}\|$$

Page 142 Line 2 should end ‘= 0’.

Page 148 Since f maps to \mathbb{R} we have $\epsilon(\mathbf{h}) \in \mathbb{R}$ and on line -4 should have $|\epsilon(\mathbf{h})|$ rather than $\|\epsilon(\mathbf{h})\|$.

Page 152 Last line of Exercise 7.27 replace ‘withot’ by ‘without’.

Page 152 Exercise 7.30 Replace $g(-\theta) = -g(\theta)$ by $g(\pi + \theta) = -g(\theta)$.

Page 161 Line -3 Replace $i = 1$ by $j = 1$ twice (once in sum, once in union).

Page 163 [A clarification rather than a correction] Last line but one of Exercise 8.4, ‘whatever we assume’ can be replaced by ‘whatever we assume about $|E|$ ’.

Page 163 Exercise 8.5. Replace E_q by E_j .

Page 163 Exercise 8.7 (a) ‘a volume’ rather than ‘an volume’.

Page 167 Pair of displayed inequalities towards end of page are garbled. Should read

Using this and corresponding results, we obtain

$$\begin{aligned} I(f) + \epsilon/4 > S(f, \mathcal{D}) &\geq s(f, \mathcal{D}) > I(f) - \epsilon/4, \\ I(g) + \epsilon/4 > S(g, \mathcal{D}) &\geq s(g, \mathcal{D}) > I(g) - \epsilon/4. \end{aligned}$$

Page 170 Exercise 8.21 (ii) comma missing. $s(f^2 D)$ should be $s(f^2, D)$.

Page 170 Exercise 8.23. Second line replace Exercise 8.17 by Exercise 8.21.

Page 172 Exercise 8.29 (ii) is wrong as it stands. We need f to be continuous. Replace by ‘Show that if $f : [a, b] \rightarrow \mathbb{R}$ is continuous with only a finite number of local maxima and minima then ...’.

Page 184 Exercise 8.59, beginning of second paragraph ‘ $g : [a, b] \times [c, d] \rightarrow \mathbb{R}$ ’.

Page 203 Exercise 9.22. Interchange dx and dy in the middle integral.

Page 218 Last paragraph should (I hope) read:-

By observing that $WA = XZ$, or otherwise, show that the area of the triangle AXD is $m^{-1} \sin(\pi/(2n))$. Show that YW has length $2(\sin(\pi/2n))^2$ and deduce, or prove otherwise, that the triangle XAB has area given by $\sin(\pi/n)((2m)^{-2} + 4(\sin(\pi/2n))^4)$. Conclude that

$$A(m, n) = 2n \sin \frac{\pi}{2n} + n \sin(\pi/n) \left(1 + 16m^2 \left(\sin \frac{\pi}{2n} \right)^4 \right)^{1/2}.$$

Page 223 Third line add question mark: wherever we can’?

Page 226 Lemma 10.7 (i) minus sign needed. $\log_e N! = N \log_e N - N + \theta(N)N$

Page 227 First sentence of part (ii) of the proof should read ‘In what follows we shall be replacing an integer m by a real number y with $|m - y| \leq 1$.’

Page 227 Exercise 10.8 (v) $H(t) \rightarrow 0$ as $t \rightarrow 0$ through positive values.

Page 228 Paragraph following Exercise 10.10 Middle sentence should start ‘Since the remaining \mathbf{y}_j with $2 \leq j \leq N$ have been chosen at random, independently of \mathbf{y}_1 ’

Page 234 Exercise 10.40 (ii). Wrong as it stands. Set $d_2(x, y) = d(x, y)^{1/2}$.

Page 235 Exercise 10.44 (ii). Replace ‘between metric spaces’ by ‘between metrics on a space X .’

Page 238 Exercise 10.51. Last displayed formula. Replace P' by P'' .

Page 240 Exercise 10.56: Properties (iv) to (vii) should be relabelled as (iii) to (vi).

Page 280 In proof of Lemma 11.80 Replace ‘ $r_\alpha(0) = 1$ ’ by ‘ $r_\alpha(1) = 1$ ’

Page 281 Displayed formula in Exercise 11.83 (ii) should have even exponents to give

$$1 + \frac{1}{2} \left(\frac{2x}{1+x^2} \right)^2 + \frac{1}{2} \times \frac{3}{4} \left(\frac{2x}{1+x^2} \right)^4 + \frac{1}{2} \times \frac{3}{4} \times \frac{5}{6} \left(\frac{2x}{1+x^2} \right)^6 + \dots$$

Page 282 Exercise 11.85, last line: Question, so ‘?’.

Page 292 Exercise 12.1, last line ‘whenever $a \leq 0 \leq b$.’

Page 300 In Exercise 12.25(i), the initial condition is ‘ $e(0) = 1$ ’ (not ‘ $e(0) = 0$ ’).

Page 302 Last paragraph. ‘Here, as usual, $y(s+) = \lim_{t \rightarrow s, t > s} y(t)$ and $y(s-) = \lim_{t \rightarrow s, t < s} y(t)$.’

Page 302 Last paragraph. δ_c should be δ_s and ‘a unit impulse at c ’ should be ‘a unit impulse at s ’.

Page 303 Replace ‘ $y'_1(s)y_2(s) - y_1(s)y'_2(s)$ ’ twice by ‘ $y_1(s)y'_2(s) - y'_1(s)y_2(s)$ ’. In Definition 12.27, replace ‘ $u'_1(s)u_2(s) - u_1(s)u'_2(s)$ ’ twice by ‘ $u_1(s)u'_2(s) - u'_1(s)u_2(s)$ ’. (It is, of course, traditional to make this kind of mistake.)

Page 304 2nd line below Exercise 12.29: ‘We write $G(s,t)=y(s)$ ’ should be ‘We write $G(s,t)=y(t)$ ’.

Page 316 Fifth and second last lines. δ_1 and $\tilde{\rho}$ should be interchanged.

Page 319 Last sentence of proof of Theorem 13.13 should be replaced by. ‘Let $V = B(w, \rho)$, $B = f^{-1}(V)$ and apply Lemma 13.12 and Lemma 13.19.’

Page 345 First word of sixth line is ‘yes’ rather than ‘no’.

[Which, for some reason, reminds me of Vanbrugh's *The Provoked Wife*

Belinda: Ah! but, you know, we must return good for evil.

Lady Brute: That may be a mistake in the translation.]

Page 350 Line 16. Replace ' $n \rightarrow 0$ ' by ' $n \rightarrow \infty$ '.

Page 353 [A clarification rather than a correction] End of second paragraph add 'We note that $\theta(x_j) \rightarrow [\mathbf{x}]$.'

Page 353 Fifth line. Replace ' j^{-1} ' by ' $\theta(j^{-1})$ '.

Page 353 Lines -11 and -9. Replace ' $\theta(1/2)$ ' by ' $\theta(5/6)$ '.

Page 354 To be consistent with our choice elsewhere we should replace \mathbb{N} by \mathbb{N}^+ . [So \mathbb{N} is the set of positive integers and \mathbb{N}^+ the set of strictly positive integers.]

Page 408 In Exercise K7, $a_{n+1} - a_n$ is increasing (not decreasing).

Page 415 Line 12. Replace 'decreasing' by 'increasing' to get "true if we replace ' g continuous' by ' g increasing'?"

Page 428 In lines 3 and 4 of Exercise K49 replace '(see part (d) of Exercise 4.58)' by '(see part (e) of Exercise K48)' and 'Using part (b) of Exercise 4.58' by 'Using part (c) of Exercise K48'.

Page 454 Exercise K.102. First line of part (i). Replace ' $t \in \mathbb{T}$ ' by ' $t \in \mathbb{R}$ '.

Page 460 Exercise K.112 middle paragraph. Replace ' $f - \alpha$ ' by ' $g - \alpha$ '.

Page 461 [Since the matrix A is symmetric this is a clarification rather than a correction.] In formula in part (iv), replace a_{i1} by a_{1i} .

Page 465 Exercise K128. Final formula in (i) is wrong. Replace

$$\sum_{[y_{k-1}, y_k] \triangle [x_{i-1}, x_i]} \quad \text{by} \quad \sum_{\substack{[y_{k-1}, y_k] \cap [x_{i-1}, x_i] \neq \emptyset \\ [y_{k-1}, y_k] \not\subseteq [x_{i-1}, x_i]}}$$

In line -3 ' $j(b-a)/N$ ' should be replaced by ' $j(b-a)/n$ '.

Page 477 Exercise K147. First sentence repeated twice.

Page 537 Exercise K257. ' $(-1)^n$ ' missing.

$$\cosh x \cos x = \sum_{n=0}^{\infty} \frac{(-1)^n 4^n x^{4n}}{(4n)!}$$

Page 556 Exercise K293. In first formula in (ii), replace $f(t, u)$ by $f(t, x)$.

Page 568 Line -3 'use' should be 'used'.

index Should contain 'Leader, Imre' page 505. Might contain Peirce pages 108 and 453