Real Analysis, H.L Royden and P.M. Fitzpatrick   Errata/Comments on Fourth Edition

Last Edited on 2013-04-05   Dedication Page: Change to 'I dedicate this book to John Slavins, H.L. Royden, and my wife, Teresita Lega'.(Mr. Slavins and Mr. Royden were inadvertently omitted.)

Contents

15.1: Change 'Helley' to 'Helly' here and throughout the book. (There are approx. 28 instances in all.)

19.2: Change '$\leq \infty$' to '$< \infty$'.

19.4: Change '< 1' to '$< \infty$'.

Preface: Page x, 4 lines b. Suggestions: Change '1998 ' to '1990 '.

Preliminaries: Page 4, line -9: Delete 'is defined '.

Chapter 1

Page 9: In the line after **least upper bound**, change 'l.u.b. S ' to 'l.u.b. E '.

Page 9: Two lines after **least upper bound**, change 'sup S ' to 'sup E '.

Page 12, line before Problems: Change 'natural' to 'rational'.

Page 13, Problem 15 (iii): Change 'r^{n-1}' to 'r^{n+1}'.

Page 14, line -10: (The image of g as defined in the text is contained in the integers, not the natural numbers.) Replace the sentence beginning 'Define the mapping'by 'Define the mapping g from **Q** to **N** by $g(x) = 2((p + q)^2 + q)$ for $x = p/q > 0$, $g(0) = 1$, and $g(x) = g(-x) + 1$ for $x < 0$'.

Page 17, line 4: Change 'numbrs' to 'numbers'.

Page 17, line -7: Change 'open interval that x' to 'open interval that contains x'.

Page 18, line 3: Change '$X \sim E$' to '$\mathbf{R} \sim E$'.

Page 18, line 12: Change 'of F' to 'of E'.

Page 19, line 6: Change 'Proposition 4' to 'Proposition 11'.

Page 19, line 8: Change '$F \subseteq$' to '$F\_1 \subseteq$'.

Page 20, line 6: Change 'Proposition 4' to 'Proposition 11'.

Page 23, line -1: Change 'lim inf' to 'lim sup'.

Page 24, Problem 42, line 1: Change '$a\_n > 0$' to '$a\_n \geq 0$'.

Page 24, Problem 44, line 1: Change '$0 < x < 1$' to '$0 \leq x \leq 1$'.

Page 24, Problem 44, line 4: Change 'q/p^n' to '$q/p^n, 0 < q < p^n$'.

Page 27, 8 lines before Problems: Change'Monotone Convergence Theorem for Sequence for Real Sequences' to 'Theorem 15 and its proof'.

Page 27, 7 lines before Problems: Change 'is a sequence in' to 'is a decreasing sequence in'.

Chapter 2

Page 31, line -2: Change '$m*(E)$' to '$m*(C)$'.

Page 32, line 15, Change '$b\_1 \notin$' to '$b \notin$'.

Page 32, line -4, Change '(a_i, b_i)' to '(a_k, b_k)'.

Page 35, line 5: Change 'Constantine' to 'Constantin'.

Page 39, line 2: Change the second 'A_1' to 'A_2'.

Page 41, line 12: Change '))' to ')'.

Page 41, line 15: Change 'O that' to 'O_k that'.

Page 43, Problem 18: Change to 'Let E have finite outer measure. Show that there is a G_δ set G $\supseteq$ E with m(G) = m*(E). Show that E is measurable if and only if there is an F_δ set F $\subseteq$ E with m(F) = m*(E).'

Page 44, Thm. 14, line 2: Change 'countable' to 'countably'.

Page 47, line -2: Change '>' to '$\geq$'.

Page 49, Problem 29 (iii), line 1: Change 'difference is irrational' to 'difference is irrational or zero'.

Page 51, line -6: Change '**C**' to '**C**,'.

Page 52, lines 13, 17, 23, 24: Change '*C*' to '**C**'.

Page 53, Problem 38, line 3: Change '*zero*' to 'zero'.

Page 53, Problem 39, line 3: Change 'dense in' to 'is dense in'.

Page 53, Problem 44: Change 'for every … subset' to 'every open set O has a non-empty open subset'.

Chapter 3

Page 55, line 8, Change '))' to ')'.

Page 55, Proposition 2: Change 'function f' to 'real-valued function f'.

Page 57, line -5: Change 'Lemma 21' to 'Proposition 21'.

Page 57, line -1: Change 'χ_A' to 'χ_A (see p. 61 for the definition)'.

Page 60, 2 lines before Prop. 9: Change 'measureable' to 'measurable'.

Page 61, line 3: Change 'measureable' to 'measurable'.

Page 61, 2 lines before Definition: Change 'step functions' to 'step functions (see p. 69 for the definition)'.

Page 62, line 4: Change 'Defne' to 'Define'.

Page 63, lines 2, 6: Change ' ψ_n' to 'φ_n'.

Page 65, Pf. of Lem. 10, l. -2, -1: Change 'ε' to 'δ'.

Page 65, Pf. of Lem. 10, line -2: Change 'E_n' to 'E_N'.

Page 67, line 1: Change '≤' to '<'.

Page 67, Problem 30, line 2: Change 'may be' to 'is'.

Chapter 4

Page 73: Two lines after **lower and upper Lebesgue integral**, change ',}' to '},'.

Page 73: Four lines after **lower and upper Lebesgue integral**, change '.}' to '}.'.

Page 76, line 10: Change 'upper bound bound' to 'upper bound'.

Page 79, footnote 7, line -2: Change 'of a subset' to 'on a subset'.

Page 80, Pf. of Prop. 9, l. 2, 3: Change 'x ∈ X' to 'x ∈ E'.

Page 81, line 3: Change 'g' to 'k'.

Page 81, 3 lines after Form. (13): Change 'h(x) =' to 'k(x) ='.

Page 81, 4 lines after Form. (13): Change 'h ≤ g' to 'k ≤ g'.

Page 83, line -5: Change '∫ f_n' to $\int_E$ f_n'.

Page 85, Problem 24 (ii): Change '≤, f' to '≤ f'.

Page 86, Pf. of Prop. 15, line 1: Change 'Proposition 13,' to 'Proposition 13'.

Page 89, Formula (22): Change 'f'(x)' to 'f'(x) < ∞'.

Page 92, line -6: Change 'E_0' to 'E'.

Page 93, line 1: Change 'δ' to 'δ_0'.

Page 94, Pf. of VCT, line 1: Change 'Propositions 25' to 'Proposition 25'.

Page 94, 2 lines after Form. (29): Change 'subset of E' to 'subset A of E'.

Page 94, 3 lines after Form. (29): Change 'subset of A' to 'subset A of E'.

Page 94, line -3: Change the last 'f_n' to 'f'.

Page 95, line after Form. (30): Change 'Propositions 23 and 24' to 'Proposition 24'.

Page 96, Problem 52: Change '(a)', '(b)', and '(c)' to '(i)', '(ii)', and '(iii)', resp.

Chapter 5

Page 98, Definition, line 2: Change 'a a subset' to 'a subset'.

Page 99, Problems 1 and 2: Interchange them.

Page 101, line 5: Change 'f_{n_k}' to 'f_{n_k} (x)'.

Page 101, Formula (6): Change '0' to '$f \equiv 0$'.

Page 103, line 4: Change 'are φ* and ψ*' to 'φ* and ψ* are'.

Page 103, lines 4, 5: Change 'real-valued' to 'real'.

Page 104, Pf. of Thm. 8, line 5: Change 'upper' to 'are upper'.

Chapter 6

Page 110, line 2: Change '∞' to 'n'.

Page 113, Remark, line -1: Change 'mathematics' to 'mathematical'.

Page 113, Formula (15): Change '$\int_b^a$ ' to '$\int_a^b$ '.

Page 113, line -4, Change '≤' to 'f ≤'.

Page 113, footnote 3, line 1: Change 'Chapter 8' to 'Chapter 9'.

Page 115, Problem 17: Change '(15)' to '(18)'.

Page 118-119, Problem 29: Change '(a)' and '(b)' to '(i)' and '(ii)', resp.

Page 119, Problem 32, line 2: Change the first '*TV* ' to '*V* '.

Page 119, Problem 36: Change 'nondegenerate closed subinterval of [0, 1] that contains x_0' to 'subinterval of [0, 1] of the form [a, b] ∩ [0, 1], where x_0 ∈ (a, b)'.

Page 121, line 5: Change '*TV* ' to '*V* '.

Page 122, Formula (26): Change ', and' to 'and'.

Page 123, line 2: Change '*7. Each*' to '*8. Each*'.

Page 123, Problem 38, line 3: Change the first '<' to '< ε if'.

Page 124, Formula (28): Change '$\int_b^a$ ' to '$\int_a^b$ '.

Page 124, line before Form. (30): Remove '(page 95) '.

Page 126, Formula (35): Change '(x_1, x_2) ⊆ [a, b]' to '[x_1, x_2] ⊆ (a, b)'.

Page 126, line -2: Change 'Theorem 18' to 'Theorem 11'.

Page 129, Problem 56 (vii), l. 1: Change '*O*' to '*g(O)*'.

Page 129, Problem 57, line 1: Change 'the last part' to 'part (vi)'.

Page 132, Pf. of Thm. 18, line -1: Interchange '*u* ' and '*v* ' in the quotient.

Page 133, line 12, Change '[a, b]' to '[0, 1]'.

Page 134, Problem 71, lines 2, 3: Change '(45)' to '(43)'.

Chapter 7

General: See p. 253 for the definition of 'linear space'.

Page 137, Definition, line 1: Change 'functional' to 'function'.

Page 138, line 1: Change 'positivity' to 'nonnegativity'.

Page 138, line -3: Change '∈' to 'f ∈'.

Page 139, Problem 2, line 2: Change 'to the sum' to 'as the sum'.

Page 139, line -4: Change 'L^1' to 'L^p'.

Page 140, line before Formula (4): Change 'X, μ' to 'E'.

Page 140, Pf. of Thm. 1, line 2: Change 'f' to 'g' in two places.

Page 143, line 2, Change 'f^{p_1}' to '|f|^{p_1}'.

Page 143, 1st Example, line 3: Change '$\alpha <$' to '$\alpha \leq$'.

Page 143, 2nd Example, line 2: Change '(1, ∞)' to '(0, ∞)'.

Page 143, 2nd Example, line 3: Change 'ln x' to '|ln x|'. Change 'x > 1' to 'x > 0'.

Page 143, Problem 9: Change 'a = b = 1' to 'a^p = b^q'.

Page 143, Problem 12, line 1: Change '< ∞' to '≤ ∞'.

Page 144, Problem 20, line 1: Change '< ∞' to '≤ ∞'.

Page 144, Problem 22, line 1: Change '1 < p' to '1≤ p'.

Page 145, Proof of Proposition 4: Change '‖ − ‖_p' to '‖ − ‖' in six places.

Page 145, line -5, Change '=' to '≤'.

Page 145, line -3: Change 'lemma' to 'proposition'.

Page 146, Pf. of Prop. 5, line 2: Change 'nonnegative' to 'positive'.

Page 147, line 2, Change 'convergent' to 'Cauchy'.

Page 148, Thm 7, line 3, Change 'only' to 'only if'.

Page 148, Pf. of Thm. 7, line 4: Change the 2nd and 4th 'f_n' to 'f'.

Page 149, Theorem 8, line 5: Change 'f' to 'f_n'.

Page 150, Problem 30, line 5: Change 'f_k' to 'f_n' in two places.

Page 150, Problem 32, line 5: Change 'f_k' to 'f_n' in two places.

Page 150, line -2: Change ', provided' to 'provided'.

Page 151, line -2: Change ', and seek' to '. We seek'.

Page 152, line 1: Change 'U∩A' to 'U ~ A'.

Page 153, Problem 39, line 1: Change '< ∞' to '≤ ∞'.

Page 154, Problem 48, line 5: Change '‖Φ(f) − Φ(g)‖_p' to '‖Φ(f) −Φ(g)‖_p^p '.

Chapter 8

Page 155, 2 lines b. Form. (iii): Change 'to said' to 'is said'.

Page 157, Pf. of Prop. 2, l. 1, 2: Change 'On the other hand' to 'If p > 1'.

Page 157, Pf. of Prop. 2, line 3: Change '‖g‖^{q−1}_q ' to '‖g‖^{1-q}_q'.

Page 157, Pf. of Prop. 2, line -1: Add at the end of the proof: 'If p = 1, we suppose that ‖g‖_∞ > ‖T‖_*. There is a set E_0 of finite positive measure on which |g| > ‖T‖_*. Define f = sgn(g) ·χ_{E_0}/m(E_0). Then f belongs to L^1(E), T(f) > ‖T‖_*, and ‖f‖_1 = 1. This contradicts (8), showing that ‖T‖_* = ‖g‖_∞.'

Page 158, line -8: Change '|φ_n |^q' to 'φ_n^q'.

Page 158, line -3: Change '0,' to '0'.

Page 159, line 4: Change '∫_I   ' to '∫_a^b   '.

Page 161, 2 lines b. Form. (16): Change 'theorem tells' to 'theorem and Proposition 2 tell'.

Page 161, Pf. of RRT, line -4: Change 'Then T is a bounded' to 'Then $\hat{T}$ is a bounded'.

Page 161, 1st Remark, line 1: Change 'Lebesgue-Stieltjes' to 'Riemann-Stieltjes'.

Page 162, Problem 10, line 3: Change 'TV (f)' to 'TV (g)'.

Page 163, line 3: Change 'Radamacher' to 'Rademacher'.

Page 163, line -3: Change 'f_n' to 'g_n'.

Page 163, line -1: Change 'f_n' to 'g_n'.

Page 164, line -8, Change '(f_n)' to '(f_k)'.

Page 167, line after Formula (24): Change the font from italic to normal.

Page 167, 1st example, line 1: Change '1 < p' to '1 ≤p'.

Page 167, 1st example, line 3: Change 'The preceding corollary' to 'For p > 1 the preceding theorem'.

Page 167, 1st example, line 6: Insert before 'On the other hand': 'For p = 1 we argue directly that {f_n} converges weakly to 0: First note that if h is a step function on I, then lim_{n→∞} ∫_I h(t) sin nt dt = 0. Let ε > 0. Given g ∈ L^∞(I) we observe that since I has finite measure, g ∈ L^1(I). By Proposition 10 in Chapter 7, there is a step function h for which ∫_I |g − h| < ε/2. Now choose N so that | ∫_I h(t) sin nt dt | < ε/2 for n > N. It follows that |∫_I h(t) sin nt dt | < ε for n > N.'

Page 167, 2nd example, line -1: Change '= 1.' to '= 0.'.

Page 168, Pf. of Thm. 12, line 2: Change 'Theorem 11' to 'Theorem 10'.

Page 169, Remark, line 4: Change 'Rewrite (17) as' to 'By Theorem 1 of the last chapter and Proposition 2 of this one,'.

Page 170, Problem 15, line 1: Change 'natural number n' to 'natural number *n*'.

Page 170, Problem 17 (iii): Change the second '{‖f_n‖}_p' to '‖f‖_p'.

Page 170, Problem 19, line 1: Change '1 ≤ p' to '1 < p'.

Page 171, Problem 25, line 1: Change 'bounded' to 'a bounded'.

Page 171, line -1, Remove 'for all *j* '.

Page 172, line 5, Add 'for all *j* ' in the end.

Page 172, line 10: Change 'is a dense' to 'in a dense'.

Page 172, line -9: Change 'Chapter 6' to 'Chapter 7'.

Page 173, line 7: Change '⊆ [0, 1]' to '⊆ (0, 1)'.

Page 173, line 10: Change 'd ≤ 1' to 'd < 1'.

Page 173, line 11: Change 'Chapter 5' to 'Chapter 6'.

Page 173, Remark, line 1: Remove the comma.

Page 173, Remark, line 3: Change '*tells us that*' to '*tells us that if m(E) < 1, then*'.

Page 173, Remark, line 4: Add '*If m(E) = 1, then the result holds provided one additionally assumes tightness.*'

Page 174, Problem 33, line 1: Change '1 ≤ p' to '1 < p'.

Page 174, Problem 34, line 3, Change 'dx }' to '}'.

Page 176, 1st example, line 1: Change 'Let E be' to 'For E' and 'g' to 'g a'.

Page 176, 1st example, line 6, Change first 'L^p(E)' to 'C'.

Page 176, 3rd example, line 1: Change 'a measurable set' to 'of finite measure'.

Page 178, line -6: Replace 'T is continuous' through the end of the proof with the following: 'T is continuous on L^p(E). Suppose not. Then for some f ∈ L^p(E) and ε > 0 there is a sequence {f_n} converging to f for which |T(f_n) − T(f)| ≥ ε. By taking a subsequence if necessary and relabeling, we can suppose that {f_n} is rapidly Cauchy. Therefore, according to Theorem 6 of the last chapter, {f_n} converges pointwise a.e. on E to f. Since φ is continuous, φ ∘ f_n converges pointwise a.e. on E to φ ∘ f. By the inequality (32), |φ ∘ f_n| ≤ c1 + c2 · |f_n|^p. According to Theorem 7 of the last chapter, lim_{ n→∞} ∫_E |f_n|^p = ∫_E |f|^p. We infer from the General Lebesgue Dominated Convergence Theorem that lim_{ n→∞} T(f_n) = T(f). This contradiction completes the proof.'

Page 179, Problem 41, line 1: Change '1 ≤ p' to '1 < p'.

Page 179, Problem 41, line 3: Change '≥' to '≤'.

Page 180, Problem 42, line 1: Change 'a measurable set' to 'of finite measure'.

Page 180, Problem 42, line 3: Remove the sentence beginning 'Let'.

Page 180, Problem 43, line 1: Change '1 ≤ p' to '1 < p'.

Chapter 9

Page 189, line 13, Change 'of *X*' to 'of *x*'.

Page 191, line -10, Change 'B((f(x), r))' to 'B(f(x), r)'.

Page 192, Definition, line 2: Change ', provided' to 'provided'.

Page 194, 5 lines b. Prop. 11: Change 'if is has' to 'if it has'.

Page 198, line 7: Change 'a nonempty' to 'an empty'.

Page 198, line 8: Change 'nonempty' to 'empty'.

Page 199, Pf. of Prop. 18, line 3: Change 'the Cantor Intersection Theorem' to 'Proposition 14'.

Page 201, line 2: Change 'Corollary' to 'Theorem'.

Page 201, line 6, Change '20' to '16'.

Page 201, line before Form. (4): Change ', such that' to 'such that'.

Page 201, line -2: Change ', such that' to 'such that'.

Page 203, Problem 65: Move to Section 9.2.

Page 203, Problem 66, line 1: Change 'function of' to 'function on'.

Page 203, Problem 67, line 1: Change 'function of' to 'function on'.

Page 203, Problem 67, line 2: Change 'and bounded' to 'but need not be bounded'.

Page 203, Problem 68, line 2: Change 'number c' to 'positive number c'.

Page 204, line after Form. (6): Change 'B(x, 1/m) is contained' to 'B(x, 2/m) is contained'.

Page 204, 3 lines after Form. (6): Change 'B(x, 1/2m)' to 'B(x, 1/m)'.

Chapter 10

Page 207, 2 lines before Example: Change 'x = 0' to 'x = 1'.

Page 207, Lemma 2, line 1: Change 'The' to 'the'.

Page 209, 2 lines b. Form. (3): Change 'point X we' to 'point in X that we'.

Page 210, line 2: Change 'Chapter 7' to 'Chapter 8'.

Page 210, line 9, Change 'bounded subset of' to 'bounded subset *S* of'.

Page 211, line 1, Change 'subspace' to 'subset'.

Page 211, line after Formula (5): Change 'subset of A' to 'subset A'.

Page 211, 2 lines after Form. (5): Change 'point on A' to 'point in A'.

Page 213, Formula (9): Change '))' to ')'.

Page 213, line after Formula (9): Change 'E_{m, N}' to 'E(m, N)'.

Page 213, Formula (10): Change '))' to ')'.

Page 214, lines 5-6: Change 'an open' to 'a nonempty open'.

Page 214, Problem 20, line 3: Change 'there a' to 'there is a'.

Page 215, line 2: Change 'anduncountable' to 'and uncountable'.

Page 218, line 5: Change 'O → R^2' to 'O → R'.

Page 219, line 13, Change '1/2M' to '1/(2M)'.

Page 219, Problem 33, line 2: Change 'u, v ∈ X' to 'u, v ∈ X, u ≠ v'.

Page 220, Problem 34, line 2: Change 'u, v ∈ R' to 'u, v ∈ R, u ≠ v'.

Page 220, Problem 37, line 3: Change '≤ r' to '≤ *r*'.

Page 221, Problem 44, line -1: Change 'g' to '**g**'.

Chapter 11

Page 223, Proposition 1, line 1: Change 'x in X' to 'x in E'.

Page 225, Pf. of Prop. 3, line 4: Change 'neighborhood of X' to 'neighborhood of x'.

Page 226, Problem 2: Change 'discrete' to 'trivial'.

Page 226, Problem 5 (ii), line 3: Change 'E is open' to 'E is closed'.

Page 228, Proposition 8, line 1: Change 'Tychoneff' to 'Tychonoff'.

Page 228, Pf. of Prop. 8, line -3: Change 'subset' to 'subsets'.

Page 228, Problem 14, line 2: Change 'Tychonoff but not Hausdorff' to 'not Tychonoff'.

Page 230, Problem 22, line 4: Change ':' to '|'.

Page 231, 2 lines before Prop. 13: Delete 'F ='.

Page 234, Proposition 16, line 2: Change 'of K' to 'of X'.

Page 235-236, Prop. 19 and 20: Interchange them.

Page 237, Problem 45 (ii), line 2: Change 'f ∈ Y^ X' to 'the continuous function f ∈ Y^ X'. (Thanks to Bruce Blackadar for this correction.)

Page 237, Proposition 22, line 2: Change 'f(Y)' to 'f(X)'.

Page 238, Problem 54 (iii): Delete.

Chapter 12

Page 241, Pf. of Lem. 2, line -1: Change 'compact closure' to 'closure'.

Page 243, Problem 8 (i): Change '[0, 1]' to '[-1, 1]' in two places.

Page 243, Problem 8 (ii), line 2: Change 'h^{−1}(1)' to 'h^{−1}(1) and h^{−1}(−1)'.

Page 243, Problem 8 (iii): Change '1 − φ · h' to '1 − φ · |h|'.

Page 247, Problem 22, line 4: Change 'normal' to 'normal and compact'.

Page 247, Problem 22, line 4: Change 'onto' to 'into'.

Page 248, footnote, line 3: Change 'Marshal' to 'Marshall'.

Page 249, 2 lines a. Form. (12): Remove the sentence beginning 'By possibly'.

Page 249, line after Form. (14): Change 'f belongs' to 'g belongs'.

Page 250, line 5: Change 'n > 1' to 'n'.

Page 251, line 3: Change 'Riesz's' to 'Borsuk's'.

Page 251, line 3: Change 'Hausforff' to 'Hausdorff'.

Page 251, Proof, line 5: Change 'to be' to 'be'.

Chapter 13

Page 259, Problem 15, line 1: Change 'isomporphism' to 'isomorphism'.

Page 259, Problem 21, line 1: Change 'subspace' to 'proper subspace'.

Page 260, 3 lines after Form. (5): Change '= M√n ‖x‖_*' to '≤ M√n ‖x‖_*'.

Page 262, Pf. of R.'s Lem., l. -1: Change '‖x_0 − y'‖' to '‖x − y'‖'.

Page 262, Problem 28, line 1: Change 'compact' to 'countable'.

Page 263, 2 lines a. Form. (11): Change 'y_* = T(x_*) − y_1' to 'T(x_*) = y_* − y_1'.

Page 264, line 9: Change 'y − T(u_1)' to 'y_* − T(u_1)'.

Page 264, line 11: Change 'y − T(x_n)' to 'y_* − T(x_n)'.

Page 265, 2 lines b. CG Thm.: Change 'mapping of' to 'mapping'.

Page 266, 2 lines b. Form. (14): Change 'Problem 35' to 'Problem 36'.

Page 266, 3 lines a. Form. (14): Change 'u + v' to 'v + w'.

Page 266, line -3: Change 'First assume' to 'Suppose P is a continuous projection defined on X, and let {x_n} be a sequence in P(X) converging to x. Then x_n = P(x_n) → P(x), so x = P(x). This shows that P(X) is closed. Now assume'.

Page 266, lines -2 and -1: Change 'We claim . . . To prove' to 'Since Id - P is a continuous projection, (Id - P)(X) is closed. To prove'.

Page 268, Problem 31, line 2: Change 'if and only if' to 'if'.

Page 268, Problem 33: Move to the set after Section 14.2.

Page 268, Problem 35, line 1: Change 'Suppose' to 'Let'.

Page 269, BSS Thm., line -3: Change 'for all for all' to 'for all'.

Page 270, Problem 39, line 1: Change 'mapping' to 'real-valued mapping'.

Page 270, Problem 39, line 3: Change 'at some point' to 'at all points of a dense subset of its domain. Adapt that proof to apply to mappings into any metric space'.

Page 270, Problem 39, line 3: Change 'linear' to 'continuous linear'.

Page 270, Problem 40: Interchange 'L^1' and 'L^∞' everywhere.

Page 270, Problem 40: Change '∫_E ' to '∫_a^b ' in three places.

Page 270, Problem 40, line 2: Change 'function in' to 'function'.

Page 270, Problem 42: Move to the set after Section 14.1.

Chapter 14

Page 271, 3 lines b. Sec. 14.1: Change 'two disjoint closed convex sets of X' to 'closed convex subset of X and point outside the subset'.

Page 272, Proposition 2, line 2: Change '$x \in X$' to '$x \in X, x \neq 0$'.

Page 272, Pf. of Prop. 2, line -2: Change 'belong to X' to 'belong to X, where $x \neq 0$'.

Page 272, Pf. of Prop. 2, line -2: Change 'By the first' to 'Note that $\eta(x) \neq 0$. By the first'.

Page 272, line -4: Change 'B,' to 'B.'.

Page 273, Pf. of Prop. 3, line -1: Change '$\psi\_k(x)$' to '$\psi(x\_k)$'.

Page 275, 8 lines after Form. (6): Change 'Problem 6' to 'Problem 5'.

Page 275, 8 lines after Form. (6): Move the sentence beginning 'Frequently' to the beginning of its paragraph (before 'For X').

Page 275, line after Formula (7): Change '$X^{\{**\}}$' to 'X^{*}'.

Page 275, Formula (8): Change '$\psi (x\_n)$' to '$\psi\_n(x)$'.

Page 276, Problem 2, line 2: Change 'the X_0' to 'X_0'.

Page 278, line -7: Change 'For $z \in Y$ ' to 'For $z \in Z$.'.

Page 279, Theorem 7, line 3: Change '$x \in X$' to '$x \in X, x \neq 0$'.

Page 279, Pf. of Thm. 7, line -3: Change 'belong to X' to 'belong to X, where $x \neq 0$'.

Page 279, 1st example, line 2: Change '$\psi (x\_0)$' to '$f(x\_0)$'.

Page 279, 2nd example: Change 'c0' to 'c' in four places.

Page 282, Problem 23, line 2: Change '$\parallel \psi \parallel = 1$' to '$\parallel \psi \parallel \leq 1$'.

Page 282, Problem 24, line -3: Change '$x \leq y$' to '$x < y$'.

Page 282, Problem 24, line -3: Change the sentence beginning 'Show that' to 'Suppose f is a linear functional on Y that is positive with respect to the cone C $\cap$ Y . Show that f may be extended to a linear functional on X that is positive with respect to C.'

Page 282, Problem 24, line -1: Delete 'with respect to the relation <'.

Page 282, Problem 26, line 2: Change 'functional' to 'real-valued function'.

Page 282, Problem 28, line 3: Change 'functional' to 'function'.

Page 283, line -3: Change 'Proposition 15' to 'Corollary 14'.

Page 285, 2 lines b. 1st Remark: Change 'the preceding proposition' to 'Proposition 19'.

Page 285, Problem 29, line 1: Change 'functions' to 'functionals'.

Page 285, Problem 35, line 1: Change '$1 \leq p$' to '$1 < p$'.

Page 288, Pf. of Prop. 22, l. -2: Change 'N_0' to 'N_2'.

Page 288, Pf. of Prop. 22, l. -1: Change 'E' to 'O'.

Page 288, Pf. of Prop. 23, line 3: Change 'neighborhood' to 'neighborhood of'.

Page 289, Problem 47, line 2: Change 'maps base' to 'maps a base'.

Page 290, Problem 49 (v): Change 'g' to 'f'.

Page 290, Problem 50 (iii), l. 1: Change 'nonzero' to 'nonnegative'.

Page 290, Problem 50 (iii), l. 2: Change 'f' to 'f^p' in both integrals.

Page 290, Problem 50 (iv), l. 1: Change 'nonzero' to 'nonnegative'.

Page 290, Problem 50 (iv), l. 2: Change '$< 1/n$' to '$\leq \int\_0^1 f^p/n^{\{1-p\}}$'.

Page 290, Problem 50 (iv), l. 3: Change 'f_n' to 'f_k'.

Page 290, Problem 51, line 3: Change 'the preceding problem' to 'Problem 49'.

Page 291, line 5: Change 'finite' to 'well-defined'.

Page 291, Pf. of HS Lem., line 1: Change the sentence beginning 'Let x_1' to 'Suppose x_1 is an internal point of K_1 and x_2 is any point of K_2.'

Page 291, line -1: Add 'If K_2 has the internal point, we apply the same argument, but at the end replace ψ by $-\psi$.'

Page 292, Pf. of Cor. 25, line 1: Change 'Theorem' to 'Proposition'.

Page 292, Pf. of Cor. 26, line 1: Change 'Theorem' to 'Proposition'.

Page 292, Pf. of Cor. 26, line 2: Change 'Corollary' to 'Proposition'.

Page 293, Pf. of Thm. 29, line -4: Delete the sentence beginning 'Moreover'.

Page 294, Problem 58, line 3: Change 'either compact or open' to 'compact. If K_0 is open, there is a continuous linear functional on X for which $\psi(x_0) < \inf_{x \in K} \psi(x)$ for all $x_0 \in K_0$'.

Page 295, Problem 64: Change 'Theorem 11' to 'Proposition 24'.

Page 295, Definition, line 3: Change 'a vector $x \in E$ is a convex combination of vectors u and v in K' to 'u, $v \in K$ and $\lambda u + (1 - \lambda)v \in E$ for some $\lambda \in (0, 1)$'.

Page 295, Pf. of Lem. 31, line 4: Change '$\leq \lambda \leq$' to '$< \lambda <$'.

Page 295, line -3: Change 'the Hyperplane Separation Theorem' to 'Theorem 7'.

Page 296, Pf. of KM Lem., l. -5: Change 'K. It follows from the Hahn-Banach Theorem' to 'E. It follows from Theorem 7'.

Page 296, 4 lines b. KM Thm.: Change 'space,' to 'space'.

Page 296, line -2: Change 'Weirstrass' to 'Weierstrass'.

Page 297, Problem 66, line 2: Change '=' to '$\leq$' in three places.

Page 297, Problem 67 (i): Change 'Show' to 'If X contains more than one point, show'.

Page 297, lines -2 and -1: Delete ' and is an extreme point of K'.

Chapter 15

Page 299, line -2: Change 'it certainly' to 'we infer from Theorem 7 of Chapter 14 that it'.

Page 300, 2 lines b. Problems: Change 'Corollary 6' to 'Corollary 5'.

Page 301, Pf. of K. Thm., l. -5: Change 'replaced by X^*' to 'replaced by X^{**}'.

Page 302, Problem 10 (ii), line 1: Change to 'If X_* is reflexive, use part (i) and Proposition 15 of Chapter 14 to show that X is reflexive.'

Page 303, line 4: Change 'proof of is' to 'proof is'.

Page 304, Formula (8): Change '$< N(m)$' to '$\leq N(m - 1)$'.

Page 304, Pf. of Thm. 8, line -4: Change '$N(n\_k) >$' to '$N(n\_k - 1) \geq$'.

Page 305, Problem 15, line 1: Change 'compact,' to 'compact'.

Page 305, 4 lines a. Form. (10): Change '$u_n/\|u_n\|$' to '$x_n/\|x_n\|$'.

Page 307, line 4: Change 'vanishes of' to 'vanishes on'.

Page 307, line 5: Change '$\psi\_k(x_0) = 0$ for all k' to '$\psi(x_0) = 0$ for all $\psi \in$ Z'.

Chapter 16

Page 310, Formula (2): Change ' $\inf_{h \in K} \|h\|$' to ' $\inf_{h \in K} \|h\|^2$'.

Page 310, line -2: Change to '$0 = \|h^*\|^2 + \|h_*\|^2 - 2 \cdot \inf_{h \in K} \|h\|^2 \geq 2 \cdot \|(h^* - h_*)/ 2 \|^2$ '.

Page 311, Pf. of Prop. 5, line 2: Change '(v)' to '(u)' in two places.

Page 313, Pf. of RFR Thm., l. 5: Change 'ker ψ' to 'ker ψ_0'.

Page 317, Example, line 2: Delete the 2nd and 3rd '2'.

Page 318, Problem 21, line 2: Change 'only if' to 'only if {u_n} is bounded and'.

Page 319, Proposition 14: See p. 332 for the definition of 'invertible'.

Page 319, Formula (14): Change '$\|h\|^2$' to '$c \cdot \|h\|^2$'.

Page 320, Pf. of Prop. 14, line -2: Change '$\|h\|^2$' to '$c \cdot \|h\|^2$'.

Page 322, line 1: Change '$u \rangle$ ' to '$u \rangle$ |'.

Page 322, Problem 30, line 1: Change 'Toplitz' to 'Toeplitz'.

Page 322, Problem 30, line 2: Change 'that the' to 'that'.

Page 322, Problem 30, line 2: Change '$\in h$' to '$\in H$'.

Page 323, Problem 35, line -1: Change 'unformly' to 'uniformly'.

Page 324, Problem 43, line 3: Change 'T^*T' to 'TT^*'.

Page 324, 8 lines b. Prop. 18: Delete 'or by Theorem 11, '.

Page 324, Example, line 5: Change 'K' to 'T'.

Page 328, 3 lines b. Problems: Change 'establishes' to 'obtains'.

Page 328, 2 lines b. Problems: Change 'recovered' to 'establishing'.

Page 329, Pf. of Prop. 20, line 1: Change 'Proposition 11' to 'Theorem 11'.

Page 329, line a. Formula (26): Change 'h_n' to 'u_n'.

Page 329, Pf. of Prop. 20, line -4: Change 'Thus' to 'Thus, since H_0 is closed,'.

Page 329, Pf. of Prop. 20, line -2: Change 'We infer' to 'Using Theorem 8 of Chapter 13, we infer'.

Page 330, Pf. of Prop. 22, line 3: Change 'We argue' to 'Since Id + K is one-to-one, we see that ker(Id + K)$^\perp$ = H. Using this fact, we argue'.

Page 331, Pf. of Prop. 22: In lines -5 and -4 change 'h' to 'u' in six places.

Page 331, Pf. of RST, line -5: Change '+ ker' to '$\oplus$ker'.

Page 332, Paragraph a. Def.: Change to 'Theorem 12 of Chapter 13 tells us that if H is a Hilbert space and the operator T $\in$ L(H) has a finite codimensional image, then its image is closed. Therefore each Fredholm operator has a closed image and hence, by Proposition 13, codim Im T = dim ker T*.'

Page 333, Problem 53, line -2: Change '$m \geq 1$' to '$m \geq 0$'.

Page 333, Problem 55, line 1: Change 'composition' to 'composition in either order'.

Chapter 17

Page 337, line -2: Change 'intersections' to 'countable intersections'.

Page 340, line -6: Change 'Page 52' to 'Page 53'.

Page 341, Problem 4 (i): Change 'M' to 'B'.

Page 341, Problem 5 (ii): Change to 'Show that if μ is complete, E_1 $\in$ M, and μ(E1 $\triangle$ E2) = 0, then E_2 $\in$M.'

Page 342, Problem 8 (ii): Change the first sentence to 'For E $\in$ M, define $\mu\_1(E) = \sup\{\mu(F) \mid F \subseteq E$ and $\mu(F) < \infty\}$.'

Page 343, 2 lines b. Formula (3): Change 'does not take the values ∞ and $-\infty$' to 'is finitely additive'.

Page 349, line after Formula (5): Change 'Proposition 7' to 'Proposition 6'.

Page 351, line 3: Change 'integrals' to 'intervals'.

Page 352, Problem 21: Change 'be a set' to 'be a non-empty set'.

Page 355, line -10: Change 'defined on S' to 'defined on S′ '.

Page 356, Cara.-Hahn Thm., l. 3: Change 'σ-algebra' to 'σ-algebra M'.

Page 357, line 3: Change 'agree of' to 'agree on'.

Page 358, Problem 31 (iii), line 1: Change 'collection of sets in S' to 'collection of sets in S, and define μ and μ' as in the proof of Proposition 13'.

Chapter 18

Page 359, 8 lines before 18.1: Change 'continuity,' to 'continuity'.

Page 359, line -2: Change 'page 54' to 'pages 54 - 55'.

Page 361, line 6: Change 'page 56' to 'pages 57 - 58'.

Page 361, line -5: Change 'page 58' to 'pages 57 - 58'.

Page 365, Problem 11: Change to 'Prove Corollary 7.'

Page 365, Problem 13, line 2: Change '}1/2^n' to '} ≤ 1/2^n'.

Page 366, Definition, line 2: Change '$\int_E$ ' to '$\int_X$ '.

Page 366, line before Prop. 8: Change '$\int_E$ f' to '$\int_E$ ψ '.

Page 368, Pf. of Prop. 9, line -2: Change 'E_n' to 'X_n'.

Page 372, line after 18.3: Change ') be a measurable' to ', μ) be a measure'.

Page 372, line -2: Change 'Conversely' to '. Conversely'.

Page 377, Vit. Cnv. Thm., line 4: Change '$\int_E$ ' to '$\int_X$ ' in two places.

Page 384, line -1: Change 'X_0 and thus' to 'X_+ and thus'.

Page 387, line -2: Change '$\int_E$ ' to '$\int_E$ f'.

Page 388, line -14: Change 'real-valued' to 'continuous real-valued'.

Page 388, line -1: Change 'M' to 'M/∼ ''.

Page 390, line -2: Change 'μ with respect to v_n' to 'v_n with respect to μ'.

Page 391, Proposition 24 (iii): Change ' dμ/ dv_n ' to 'dv_n/dμ '.

Page 392, Pf. of VHS Thm., l. -6: Change 'μ_n' to 'v_n' in two places.

Page 392, Pf. of VHS Thm., l. -3: Change 'ρ_μ' to 'μ' and 'μ_n' to 'v_n'.

Page 393, Problem 61, line 1: Change 'A and B' to 'A and B with μ(A∩B) finite'.

Page 393, Problem 61, line 2: Change 'ρ_μ(A,B)' to 'μ(A△B)'.

Page 393, Problem 66, line 2: Change 'to v' to 'to the finite measure v'.

Chapter 19

Page 394, Contents, 19.2: Change 'p ≤ ∞' to 'p < ∞'.

Page 394, Contents, 19.4: Change 'p < 1' to 'p < ∞'.

Page 394, Preamble, line 8: Move the sentence beginning 'In the third section' after the following sentence, and change 'third' to   'fourth'.

Page 395, line 8: Change 'Let' to 'For 1 ≤ p < ∞, let'.

Page 395, line 16: Change '= α' to '= |α|'.

Page 395, line -12: Change '= α' to '= |α|'.

Page 396, C-S Inequality, line 3: Change 'fg' to 'f · g'.

Page 397, line 1: Change 'Minkowski's' to 'H¨older's'.

Page 397, footnote: Delete 'converging '.

Page 399, line 7: Change '|f|^p' to '|f_n|^p'.

Page 399, Problem 3, line 3: Change '|f^|p' to '|f_n|^p'.

Page 399, title of 19.2: Change 'p ≤ ∞' to 'p < ∞' here and in the corresponding page headings.

Page 399, line a. title of 19.2: Change 'conjugate of' to 'conjugate to'.

Page 403, line 12: Change 'X μ' to 'X, μ'.

Page 403, line -5: Change 'dμ' to 'μ'.

Page 407, page heading: Change '1 ≤ p ≤ 1' to '1 < p < ∞'.

Page 407, title of 19.4: Change 'p < 1' to 'p < ∞'.

Page 407, line -4: Change '$\int_a^b$ g · h ' to '$\int_X$ g · h dμ '.

Page 409, Problem 16 (i), line 1: Change 'l^p' to '`l^p'.

Page 409, Problem 18, lines 2, 3: Change ', nor the Radon-Riesz Theorem, nor the Banach-Saks Theorem'to 'nor the Radon-Riesz Theorem'.

Page 413, Formula (34): Change 'h_n' to '|h_n|'.

Page 413, 2 lines a. Form. (34): Change 'measure' to 'signed measure'.

Page 413, Pf. of Thm. 12, l. -2: Change '-Saks Theorem' to '-Saks Theorem (suitably extended to signed measures)'.

Chapter 20

Page 414, line before Lemma 1: Change 'A ∈ **A** and B ∈ **B**' to 'A ∈ **A**, B ∈ **B**, and μ(A) and ν(B) are finite'.

Page 416, 3 lines b. Fub. Thm.: Change 'over Y ' to 'over E_x'.

Page 417, line -8: Change '(5)' to '(2)'.

Page 418, Pf. of Lem. 3, l. -6: Change '(5)' to '(2)'.

Page 419, Pf. of Prop. 5, l. 2: Change 'E ~ A' to 'A ~ E'.

Page 419, line -4: Change 'proposition' to 'theorem'.

Page 420, 7 lines b. Ton. Thm.: Change '$\int |f| \, d(\mu \times \nu)$ ' to '$\int_{X \times Y} |f| \, d(\mu \times \nu)$'.

Page 420, Tonelli's Thm., line 2: Change 'function' to 'function on'.

Page 422, line 1: Change 'Proposition 10,' to 'Proposition 10'.

Page 422, Problem 4, line 1: Change 'general' to 'complete'.

Page 423, Problem 6, line 2: Change '$\triangle$' to 'D'.

Page 423, Problem 6, line 3: Delete ' (is an **R**_{σδ}, in fact)'.

Page 423, Problem 7, line 2: Change 'general' to 'complete'.

Page 423, Problem 10, line 2: Change ', then' to ' and'.

Page 425, Pf. of Prop. 10, l. 3: Change 'collection on' to 'collection of'.

Page 426, line 3: Change 'collection on' to 'collection of'.

Page 427, Proof of Thm. 11: In lines -4, -2, and -1 change 'I_{k,n}' to 'I_{k,m}' in four places.

Page 427, Pf. of Thm. 11, l. -3: Change '1/n' to '1/m'.

Page 427, Theorem 13, line 1: Change 'Let E of' to 'Let E be'.

Page 429, Pf. of Prop. 15, l. 1: Change 'collection of intervals' to 'collection of bounded intervals'.

Page 430, 4 lines before Prop. 17: Change '**L**(R^n)' to 'R^n'.

Page 431, line before Form. (23): Change 'interval' to 'bounded interval'.

Page 431, Pf. of Prop. 18, l. -2: Change '<' to '≤ '.

Page 432, line 3: Change ' 1/|α| ' to '|α|'.

Page 432, Proposition 21, l. -1: Change ' 1/|c| ' to '|c|'.

Page 438, line before Form. (30): Change '$\int_a^b$ ' to '$\int_{[a,b]}$ '.

Page 440, Problem 41 (i), line 1: Change 'bounded function' to 'function'.

Page 441, Proposition 27, l. -2: Put a period at the end.

Chapter 21

Page 446, line -3: Change 'Riesz Representation Theorem' to 'Riesz-Kakutani Representation Theorem' here and throughout the remainder of the book.

Page 446, footnote, line 2: Change 'in our view' to 'in view of'.

Page 460, line after Form. (12): Change 'C_c(X)' to 'C_c(X) with 0 ≤ f ≤ 1'.

Page 461, Problem 40, line 1: Change 'space,' to 'space'.

Index

Page 497: Add 'Bolzano-Weierstrass Theorem, 21, 22, 24, 25, 28, 162, 171, 179, 200, 207'.

Page 498: Change 'Codimension one subspace, 272' to 'Codimension, finite, 266, 267, 272, 276, 277, 329, 332, 334'.

Page 498: Change 'Compactness Theorems Bolzano-Weierstrass Theorem, 21, 200' to 'Compactness Theorems Bolzano-Weierstrass Theorem, 21, 22, 24, 25, 28, 162, 171, 179, 200, 207'.