Errata and Suggestion Sheets

Advanced Calculus, Second Edition, by Patrick Fitzpatrick

November 12, 2013

Location	Error	Finder	Date
p. 8, Fig. 1.1	for "p" write "r" (four occurances)	SI	30 Sep 2013
p. 11, ln. -3	for "$b^2 < r$" write "$b^2 < c$"	HH	1 Oct 2013
p. 13, ln. -1	for "... number a and b," write "... numbers a and b,"	ME	1 Feb 2010
p. 16, 1c	"$\mathbb{Q}\backslash\mathbb{N}$" should read "$\mathbb{Q}\backslash\mathbb{Z}$."	JD	6 Oct 2005
p. 16, # 4	would "if they exist" be clearer than "if they are defined"?	TT	27 Oct 2013
p. 18, ln. 14	"$1 - T$" should read "$1 - r$."	RM	7 Oct 2005
p. 21, # 23	for "Let a be a nonzero number ..." write "Let a and b be nonzero numbers ..."	TT	8 Oct 2013
pp. 30, 32	To slightly improve clarity, the Linearity Property should come before Theorem 2.13.	RM	10 Oct 2005
p. 31, ln. -11	for "indices $n \geq N$" write "indices $n \geq N_1$"	MH	22 Oct 2013
p. 31, Proof	Is there a reason to use "N_1" rather than "N" throughout?	TT	22 Oct 2013
p. 36, ln. 16	for "midpoint $x = (a+b)/2$" write "midpoint $s = (a+b)/2$"	MH	22 Oct 2013
p. 40, ln. 2	"$s_4 + \frac{1}{2} = 1 + \frac{3}{2}$" should read "$s_4 + \frac{1}{2} \geq 1 + \frac{3}{2}$."	JD	17 Oct 2005
p. 41, Fig. 2.3	for "... converges to c." write "... converges to x"	NS	28 Oct 2013
p. 42, # 5	for "Let c be a number" write "Let $c \neq 0$ be a number"	TT	25 Oct 2013
p. 49, ln. 3	for "... n is odd," write "... n is odd and $n \geq 3$,"[1]	TT	1 Nov 2013
p. 49, ln. 11,13	for "$\{I_n\}_{n=1}^{\infty}$" write "$\{I_n\}_{n=2}^{\infty}$"	TT	1 Nov 2013
p. 49, ln. 13	for "$\cup_{n=1}^{N} I_n$" write "$\cup_{n=2}^{N} I_n$"	TT	1 Nov 2013
p. 50, ln. 6	for "$S \subseteq \cup_{n=1}^{N} A_n$" write "$S \subseteq \cup_{n=1}^{N} I_n$"	HH	1 Nov 2013
p. 50, ln. 13	for "... n is odd," write "... n is odd and $n \geq 3$,"	TT	1 Nov 2013
p. 50, ln. 16-19	for "$\{J_n\}_{n=1}^{\infty}$" write "$\{J_n\}_{n=2}^{\infty}$"	TT	1 Nov 2013
p. 51, ln. -13	for "... $(x_{n_k}) \geq n_k \geq k$..." write "... $(x_{n_k}) > n_k \geq k$..."	TT	1 Nov 2013
p. 54, ln. -9	"sequence $(\{-1/n\}$" should read "sequence $\{-1/n\}$"	LF	9 Feb 2008
p. 59, Fig. 3.2	for "supremun" write "supremum"	TB	11 Nov 2013
p. 59, Fig. 3.3	for "on $(0, 1]$" write "on $(0, 1)$"	LM	11 Nov 2013
p. 62, ln. 7	"the value 0." should read "zero or negative values."	JF	2 Nov 2005
p. 67, ln. 21	"$1/n$" should read "$-1/n$."[2]	SH	9 Nov 2005
p. 67, ln. 22	"$2 + 1/n^2$" should read "$-2 - 1/n^2$."	JD	9 Nov 2005
p. 78, ln. 22	"monotonically increasing" should read "monotone."	JF	9 Nov 2005
p. 81, ln. 23	"$\mathbb{D}$" should appear "D."	JD	14 Nov 2005
p. 90, ln. 14	"$\lim_{x \to 0,\, x>0} \frac{f(x) - f(0)}{x - 0} = -1$" should read "$\lim_{x \to 0,\, x<0} \frac{f(x) - f(0)}{x - 0} = -1$."	CB, BH, GV	18 Nov 2005
p. 90, ln. -1 & p. 91, ln. 1	"$... + x_0^{n-2} + x_0^{n-1}$" should read "$... + x x_0^{n-2} + x_0^{n-1}$."	JD	18 Nov 2005
p. 94, # 3	The function value $f(0)$ is defined twice.	JD	14 Nov 2005
p. 99, (4.8)	"$x - x$" should read "$x - x_0$" in two denominators.	RM	7 Dec 2005
p. 107, ln. 8	"$x_0 < x_0 + \delta$" should appear "$x_0 < x < x_0 + \delta$"	RM	29 Nov 2005

[1] Alternatively, one might let $I_n \equiv (c - n - 1, c - 1/n)$ to avoid the degenerate interval for the case $n = 1$.

[2] Alternatively, one could let $u_n = n + 1/n$ and $v_n = n$. This would take care of both errors on p. 67.

Location	Error	Finder	Date
p. 107, ln. -15	for "In Section 9.5," write "In Section 9.6,"	AD	31 Jan 2010
p. 112, ln. 3	"$g^{(n)}(x_0) = n!$" should appear "$g^{(n)}(x) = n!$"	TT	21 Jul 2009
p. 112, ln. 14	"$\frac{f^{(n)}(x_n)}{g^{(n)}(x_0)}$" should appear "$\frac{f^{(n)}(x_n)}{g^{(n)}(x_n)}$"	KW	30 Nov 2005
p. 120, ln. 15	for "inverse function $\mathbb{R}$." write "inverse function on $\mathbb{R}$."	TT	Jan 2008
p. 142, ln. -1	for "...1988), a clear..." write "...1988), is a clear..."	NR	25 Jan 2010
p. 144, ln. -10	the second "(6.19)" should be "(6.20)"	JF	25 Jan 2006
p. 145, ln. 3	for "$[a, b] : \mathbb{R} \to \mathbb{R}$" write "$f : [a, b] \to \mathbb{R}$"	JF	25 Jan 2006
p. 149, # 4 b.	for "$(b - a)/2$" write "$(b^2 - a^2)/2$"	JH	28 Jan 2008
p. 150, ln. -10	for "The f is" write "Then f is"	JF	21 Feb 2006
p. 152, ln. 5	for "$L(f, P_n)$" write "$U(g, P_n)$"	BH	25 Jan 2006
p. 152, ln. 12	for "$\cdots \le L(f, P) + U(g, P)$" write "$\cdots \le U(f, P) + U(g, P)$"	JH	3 Feb 2008
p. 153, ln. -1	for "$\cdots \le U(f + g, P_n) \le L(f, P_n) + U(g, P_n)$." write "$\cdots \le U(f + g, P_n) \le U(f, P_n) + U(g, P_n)$."	AS	29 Mar 2009
p. 156, ln. 10-12	for "$[x_{i-1} - x_i]$" write "$[x_i - x_{i-1}]$"	CS	28 Jan 2010
p. 160, ln. -2	for "Section 7.4." write "Section 7.3."	IB	7 Feb 2008
p. 162, ln. -8	for "$L(f, P)$" write "$L(F', P)$"	IB	7 Feb 2008
p. 162, ln. -8	for "$R(f, P)$" write "$U(F', P)$"	IB	7 Feb 2008
p. 164, # 3	for "$\int_a^b f = 4$" write "$\int_2^6 f = 4$"	IB	6 Feb 2008
p. 184, Lemma	See instructor for corrected lemma statement and proof.	TT	14 Aug 2009
p. 186, Thm	Proof of theorem still true with corrected lemma.	TT	14 Aug 2009
p. 187, ln. -11	for "index $i \ge 1$" write "index i such that $1 \le i \le n$"	JH	19 Mar 2008
p. 189, # 8	for "Supose" write "Suppose"	JF	20 Feb 2006
p. 201, ln. 4	for "$x = 0$" write "$x_0 = 0$"	LF	4 Mar 2008
p. 201, ln. 8	for "$x = 0$" write "$x_0 = 0$"	LF	4 Mar 2008
p. 201, ln. 12	for "$x = 0$" write "$x_0 = 0$"	LF	4 Mar 2008
p. 201, ln. -7	for "$x = 1$" write "$x_0 = 1$"	LF	4 Mar 2008
p. 202, ln. -10	for "strictly increasing..." write "strictly decreasing..."	RM	22 Feb 2006
p. 202, ln. -1	for "at $x = 0$" write "at $x_0 = 0$"	TT	11 Mar 2008
p. 203, ln. 10	for "$(x - x_0)^n$" write "$(x - x_0)^{n+1}$"	RM	22 Feb 2006
p. 206, ln. -1	for "$\ln(n + 1) = \ln 1$" write $\ln(n + 1) - \ln 1$"	RM	22 Feb 2006
p. 217, ln. 6	for "number n" write "number k"	IB	7 Mar 2008
p. 221, ln. 10	for "about $x = 0$" write "about $x_0 = 0$"	TT	11 Mar 2008
p. 225, ln. -6	for "$1 \le k \le n$." write "$0 \le k \le n$."	TT	26 Feb 2006
p. 233, ln. 2	for "for index" write "for every index"	TT	01 Mar 2006
p. 235, ln. -9	for "$(0, c)$" write "$(0, b)$"	JD	01 Mar 2006
p. 240, ln. -2	for "$\lim_{n\to\infty} \left(\frac{a_k}{b_k}\right)$" write "$\lim_{k\to\infty} \left(\frac{a_k}{b_k}\right)$"	TT	01 Mar 2006
p. 241, ln. 12	for "...value is 1." write "...value is 1,"	AH	26 Feb 2010
p. 241, Fig. 9.2	for "...$\lim_{n\to\infty} 1^n = 0$." write "...$\lim_{n\to\infty} 1^n = 1$."	NC, AD, NR	15 Mar 2010
p. 242, ln. -1	for "...natural number k" write "...integer k"	NR	26 Feb 2010
p. 243, ln. 8	for "...number n, ..." write "...number $n \ge 2$, ..."	TT	11 Mar 2008
p. 243, ln. 9	for "$f_n(0) = f(2/n) =$" write "$f_n(0) = f_n(2/n) =$"	RM	06 Mar 2006
p. 243, ln. 10	for "and $[2/n, 0]$" write "and $[2/n, 1]$"	RM	06 Mar 2006

Location	Error	Finder	Date
p. 243, Fig. 9.4	for "$\left(\frac{1}{n}, 1\right)$" write "$\left(\frac{1}{n}, n\right)$"	RM	06 Mar 2006
p. 251, ln. 4	for "$4[b-a]$" write "$[4(b-a)]$" (But $[3(b-a)]$ works!)	TT	05 Mar 2010
p. 251, ln. -8	for "$6[b-a)]$" write "$[6(b-a)]$" (But $[2(b-a)]$ works!)	TT	05 Mar 2010
p. 257, ln. -4	for "Cauchy on A" write "Cauchy on A"	JD	08 Mar 2006
p. 265, Fig. 9.6	left figure: for "$(l, 2l)$" write "(l, l)"	AD	15 Mar 2010
p. 265, Fig. 9.6	Two comments: (1) It would be nice to use the *same* script l as in the surrounding text. (2) It would be nice if the graphs had the same scales for both x- and y-axes.	TT	21 Mar 2010
p. 266, ln. 16	for "$\sum_{k=1}^{\infty} h_k(x)$" write "$\sum_{k=0}^{\infty} h_k(x)$"	TT	10 Mar 2006
p. 279, ln. 6	for "dist$(\mathbf{u}, \mathbf{u}')$ and" write "dist$(\mathbf{u}, \mathbf{u}') = 0$ and"	RM	29 Mar 2006
p. 302, ln. 7	for "$A : \mathbb{R} \to \mathbb{R}$" write "$f : A \to \mathbb{R}$"	JF	15 Apr 2006
p. 324, ln. 8	for "$f : \mathbb{R} \to \mathbb{R}$" write "$f : I \to \mathbb{R}$"	TT	23 Apr 2010
p. 355, ln. 4	Is "$\mathbf{e}_i$" defined in the text (other than p. 281, H.W.#2)?	JH	21 Nov 2008
p. 373, ln. 11	for "$\left(\frac{1}{k}!\right)$" write "$\left(\frac{1}{k!}\right)$"	JF	22 May 2006
p. 375, ln. -8	for "h" write "$\mathbf{h}$"	JH	21 Nov 2008
p. 391, ln. 8	for "$\nabla f(\mathbf{x}) = 0$" write "$\nabla f(\mathbf{x}) = \mathbf{0}$"	SW	May 2010
p. 474, ln. -10	the word "integrable" comes *before* it is defined (p. 475)	TT	16 May 2006
p. 479, ln. 14-15	for "in any one of the $\mathbf{P}_k(\mathbf{J})$'s" write, perhaps, "in all of the corresponding $\mathbf{P}_k(\mathbf{J})$'s"	JH	21 Nov 2008
p. 479, ln. 16	for "$\sum_{\mathbf{J} \text{ in } \mathbf{P}} U(...) - L(...)$" write $\sum_{\mathbf{J} \text{ in } \mathbf{P}} [U(...) - L(...)]$"	JH	21 Nov 2008
p. 479, ln. 14-21	It does not seem that $\mathbf{P}_k$ can be chosen as indicated. One suggestion is to: Let $\mathbf{P}_k^*$ be the partition of $\mathbf{I}$ induced by the $\mathbf{P}_k(\mathbf{J})$'s. (By this we mean that for all the $\mathbf{J}$'s in a common "row" of $\mathbf{P}$, we form the union of all the partition points of a common edge of the corresponding $\mathbf{P}_k(\mathbf{J})$'s. This union then forms one part of the partiton $\mathbf{P}_k^*$ for that corresponding edge.) It should be clear that for each $\mathbf{J}$, $\mathbf{P}_k^*(\mathbf{J})$ is a refinement of $\mathbf{P}_k(\mathbf{J})$ so that $U(f, \mathbf{P}_k^*(\mathbf{J})) - L(f, \mathbf{P}_k^*(\mathbf{J})) \leq (f, \mathbf{P}_k(\mathbf{J})) - L(f, \mathbf{P}_k(\mathbf{J}))$ for all $\mathbf{J}$ and hence $\begin{aligned} U(f, \mathbf{P}_k^*) - L(f, \mathbf{P}_k^*) &= \sum_{\mathbf{J}} [U(f, \mathbf{P}_k^*(\mathbf{J})) - L(f, \mathbf{P}_k^*(\mathbf{J}))] \\ &\leq \sum_{\mathbf{J}} [U(f, \mathbf{P}_k(\mathbf{J})) - L(f, \mathbf{P}_k(\mathbf{J}))] \\ &< m \cdot \frac{1}{km} \\ &= \frac{1}{k}. \end{aligned}$ Thus, $\lim_{k \to \infty} [U(f, \mathbf{P}_k^*) - L(f, \mathbf{P}_k^*)] = 0,$ and therefore, by the Archimedes–Riemann Theorem, the function f is integrable on $\mathbf{I}$.	TT	May 2010

Location	Error	Finder	Date
p. 479, ln. 19	for "$-L(f, \mathbf{P}_k] =$" write "$-L(f, \mathbf{P}_k)] =$"	JH	21 Nov 2008
p. 488, ln. 5	for "vol $\mathbf{J}$" write "vol $\mathbf{J}_i$" (twice)	JH	21 Nov 2008
p. 488, ln. -11	for "For positive numbers a and b, show that the ellipse" write "Show that the set"	TT	26 May 2006
p. 488, ln. -7	for "that the ellipsoid" write "that the set"	TT	26 May 2006
p. 489, ln. 6,7	for "in the interior of $\mathbf{J}$" write "in the interior of $\mathbf{I}$"	TT	27 May 2010
p. 491, ln. 2	for "$= \int_{\mathbf{J}} \hat{f}$," write "$= \int_{\mathbf{I}_1} \hat{f}$,"	TT	26 May 2006
p. 493, ln. -15	for "$\{(\mathbf{x}, g(\mathbf{x})) \dots$ " write "$\{(\mathbf{x}, f(\mathbf{x})) \dots$ "	TT	26 May 2006
p. 499, ln. 10	for "(19.3)" write "(19.1)"	TT	4 Jun 2010
p. 500, ln. 2	for "of m_i and M_i" write "of M_i"	TT	4 Jun 2010
p. 499, ln. 10	for "(19.3)" write "(19.1)"	TT	4 Jun 2010
p. 500, ln. 2	for "of m_i and M_i" write "of M_i"	TT	4 Jun 2010