

ERRATA FOR

“The Real Numbers and Real Analysis”

Ethan D. Bloch

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Below is an updated list of errata. The fault for all the errors in the book is my own, and I offer my sincere apologies for any inconvenience caused by the errors in the book.

This list was compiled with the generous assistance of: Eduardo Bravo, Greg Landweber, Ahmad Khaled, Wai Wah Lau, Einam Livnat, Guido Ursoleo, Yuanhong Zhi.

If you find any additional errors in the book, or any errors in this list of errors, I would very much appreciate it if you would let me know by email at bloch@bard.edu.

Page	Line/Item	Text	Comment/Should be
16	Line -7	“ Lemma 1.3.8 ”	Should be “ Theorem 1.3.8 ”
16	Lines (-9)–(-7)	“Whereas the proof of Theorem 1.3.8 makes use of only the properties of the integers given in Theorem 1.3.5, it turns out that not all properties of the integers can be deduced from that theorem.”	Should be “Whereas the proof given above of various parts of Theorem 1.3.8 makes use of only the properties of the integers given in Theorem 1.3.5, it turns out that not all properties of the integers can be deduced from that theorem, for example Theorem 1.3.8 (7), the proof of which makes use of Theorem 1.2.7 (13).”
25	Lemma 1.4.5 (7)		The proof of Part (7) of this lemma ultimately requires the Well-Ordering Principle (because this part of the lemma is not satisfied by the rational numbers), and so it cannot be proved at this point, but rather should be proved using Exercise 1.4.5 (which is proved using Theorem 1.4.6, which in turn is proved using the Well-Ordering Principle), together with various other parts of Lemma 1.4.5.
25	Exercise 1.4.7 (2)	“ $f < g < g + 1$ ”	Should be “ $f < g < f + 1$ ”
33	Line 7	“ $r^2 < p$ ”	Should be “ $r^2 < s$ ”
33	Line 8	“ $(r + \frac{1}{k})^2 < p$ ”	Should be “ $(r + \frac{1}{k})^2 < s$ ”

45	Lines 2–5	“There is some $p \in A - B$. Then by Lemma 1.6.5 (1) we know that $p < b$ for all $b \in B$. Let $c \in C$. Then $p + c < b + c$ for all $b \in B$. It follows from Lemma 1.6.5 (1) that $p + c \in \mathbb{Q} - (B + C)$. Because $p + c \in A + C$, we deduce that $A + C \not\supseteq B + C$.”	Should be “Suppose that $A + C = B + C$. Then $(A + C) + (-C) = (B + C) + (-C)$. By Part (1) of this theorem we see that $A + (C + (-C)) = B + (C + (-C))$, by Part (4) it follows that $A + D_0 = B + D_0$, and by Part (3) we deduce that $A = B$, which is a contradiction. Hence $A + C \not\supseteq B + C$.”
71	Lemma 2.3.9 (7)	“ $ a - b \leq a + b $ and $ a - b \leq a - b $ ”	Should be “ $ a - b \leq a + b $ and $ a - b \leq a - b $ ”
89	Line 2	“ $x \in \mathbb{N}$ ”	Should be “ $n \in \mathbb{N}$ ”
97	Line -2	“ X ”	Should be “ A ”
97	Line -1	“ X ”	Should be “ A ”
167	Line 5	“ $L = F - Q$ ”	Should be “ $L = F - U$ ”
171	Line 19	“ f has the form $f(x) = a_0 + a_1x + \cdots + a_nx^n$ ”	Should be “ p has the form $p(x) = a_0 + a_1x + \cdots + a_nx^n$ ”
171	Line 24	“ $f(r) = 0$ ”	Should be “ $p(r) = 0$ ”
189	Line 5	“exists all $i \in \mathbb{N}$ ”	Should be “exists for all $i \in \mathbb{N}$ ”
197	Line -3	“ $f'(c) \neq 0$ ”	Should be “ $f(c) \neq 0$ ”
198	Line 17	“Suppose that $b - a = c - b$ ”	Should be “Suppose that f is differentiable, that $b - a = c - b$ ”
204	Line 14	“antiderivative unique”	Should be “antiderivative is unique”
240	Line -4	“ $M \in \mathbb{N}$ ”	Should be “ $M \in \mathbb{R}$ ”
255	Lines 4–5	“Suppose that f is strictly increasing.”	Should be “Suppose that f is continuous and strictly increasing.”
255	Line 9	Remove “Suppose that f is continuous at b .”	
257	Line -8	“ $P \in \mathbb{R}$ ”	Should be “ $K \in \mathbb{R}$ ”
257	Line -8	“ $ f(x) - f(y) \leq P$ ”	Should be “ $ f(x) - f(y) \leq K$ ”
257	Line -7	“ $M_i(f) - m_i(f) \leq P$ ”	Should be “ $M_i(f) - m_i(f) \leq K$ ”

261	Line 19	$“[M, P]”$	Should be $“[P, M]”$
261	Line 20, two places	$“[M, P]”$	Should be $“[P, M]”$
272	Line 14	$“S = \{s_1, s_2, \dots, s_n\}”$	Should be $“V = \{s_1, s_2, \dots, s_n\}”$
272	Line 15	$“S$ is a representative set”	Should be $“V$ is a representative set”
272	Line 16	$“S(f, R, S)”$	Should be $“S(f, R, V)”$
272	Line 18	$“S$ is a representative set”	Should be $“V$ is a representative set”
272	Line 18	$“S(f, R, S)”$	Should be $“S(f, R, V)”$
410	Line 8	$“n \in \mathbb{R}”$	Should be $“n \in \mathbb{N}”$
410	Line -2	$“convergnent”$	Should be $“convergent”$