

Corrections and Changes to the Third and Fourth Printings

Revised July 29, 2004

The third printing has 10 9 8 7 6 5 4 3 on the first left-hand page.

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Bullets mark the more significant changes or corrections: altered hypotheses, non-evident typos, hints or simplifications, etc.

- p. 10, Def. 1.6B: *read*: Any such $C \dots$
- p. 30, Ex. 2.1/3: *replace*: change the hypothesis on $\{b_n\}$ *by*: strengthen the hypotheses (cf. p. 405, Example A.1E for the meaning of “stronger”)
- p. 47, Ex. 3.3/1d: *delete the semicolons*
- p. 48 *Add*:
3-5 Given any c in \mathbf{R} , prove there is a strictly increasing sequence $\{a_n\}$ and a strictly decreasing sequence $\{b_n\}$, both of which converge to c , and such that all the a_n and b_n are (i) rational numbers; (ii) irrational numbers. (Theorem 2.5 is helpful.)
- p. 58, Ex. 4.3/2: *Omit*. (too hard)
- p. 60, Ans. 4.3/2: *read*: 1024
- p. 63, display (9): *delete*: > 0
- p. 63, line 11 from bottom: *read*: 5.1/4
- p. 68, line 10: *replace*: hypotheses *by*: symbols
- p. 74, Ex. 5.4/1 *Add two preliminary warm-up exercises*:
 - a) Prove the theorem if $k = 2$, and the two subsequences are the sequence of odd terms a_{2i+1} , and the sequence of even terms a_{2i} .
 - b) Prove it in general if $k = 2$.
 - c) Prove it for any $k \geq 2$.
- p. 75, Prob. 5-1(a): *replace the first line of the “proof” by*:
Let $\sqrt{a_n} \rightarrow M$. Then by the Product Theorem for limits, $a_n \rightarrow M^2$, so that
- p. 82, Proof (line 2): *change*: a_n to x_n
- p. 89, Ex. 6.1/1a: *change* c_n to a_n
- p. 89, Ex. 6.1/1b *add*: to the limit L given in the Nested Intervals Theorem.
- p. 89, bottom *add*: **3**. Find the cluster points of the sequence $\{\nu(n)\}$ of Problem 5-4.
- p. 90, *add Ex. 6.3/2*: **2**. Prove the Bolzano-Weierstrass Theorem without using the Cluster Point Theorem (show you can pick an $x_{n_i} \in [a_i, b_i]$).
 - p. 90, Ex. 6.5/4: *read*: non-empty bounded subsets
 - p. 95, Display (6): *delete*: e
 - p. 106, l. 10 *read*: $-\sum(-1)^n a_n$
 - p. 107, l. 2,3 *insert*: this follows by Exercise 6.1/1b, or reasoning directly, the picture
 - p. 108, bottom half of the page *replace everywhere*: “positive” and “negative” by “non-negative” and “non-positive” respectively
- p. 148, Ex. 10.1/7a(ii) *read*: is strictly decreasing
- p. 154, line 8 from bottom *insert paragraph*:

On the other hand, functions like the one in Exercise 11.5/4 which are discontinuous (i.e., not continuous) at every point of some interval are somewhat pathological and not generally useful in applications; in this book we won't refer to their x -values as points of discontinuity since “when everybody's somebody, then no one's anybody”.

p. 161, line 11: *delete ; ,* line 12: *read <*, line 13 *read ≤*
 p. 164, *read:*

Theorem 11.4D' Let $x = g(t)$, and I and J be intervals. Then

$g(t)$ continuous on I , $g(I) \subseteq J$, $f(x)$ continuous on $J \Rightarrow f(g(t))$ continuous on I .

p. 167, Ex. 11.1/4 *read:* exponential law, $e^{a+b} = e^a e^b$,

- p. 168, Ex. 11.5/2: *rewrite:* Prove $\lim_{x \rightarrow \infty} \sin x$ does not exist by using Theorem 11.5A.

p. 180, Ex. 12.1/3: *read:* a polynomial

p. 181, Ex. 12.2/3: *change:* solutions to zeros

- p. 192, Ex. 13.1/2 *renumber as 13.2/2, and change part (b) to:*

13.2/2b Prove the function of part (a) cannot be continuous.

p. 193, Ex. 13.5/2 *change the two R to \mathbf{R}*

- p. 195, Ans. 13.3/3: *change to:* $\frac{1}{x} \sin(\frac{1}{x})$; as $x \rightarrow 0^+$, it oscillates ever more widely

p. 204, line 4: *read:* an open I

p. 228, Ex. 16.1/1a,b *read:* $(0, 1]$

p. 228, Ex. 16.2/1 *replace:* the second derivative test *by* each statement in (8)

p. 230, Ans. 16.1/2 *change 9 to 0*

p. 231, line 3- *change k to a*

p. 235, display (15): *change* $0 < |c| < |x|$ to $\begin{cases} 0 < c < x, \\ x < c < 0. \end{cases}$; *delete next two lines*

p. 243, Example 18.2, Solution, lines 4 and 7 *read:* $[0, x_1]$

- p. 248, Ex. 18.2/1 *add:* Hint: cf. Question 18.2/4; use $x_i^2 - x_{i-1}^2 = (x_i + x_{i-1})(x_i - x_{i-1})$.

p. 248, Ex. 18.3/1 *replace n by k everywhere*

p. 260, Defn. 19.6 *read:* $a = x_0 < x_1 < \dots < x_{n-1} < x_n = b$

p. 261, Solution. (b) *read:* $[1/(n+1)\pi, 1/n\pi]$

p. 261, Lemma 19.6 *rename:* *Endpoint Lemma*

p. 261, line 7- *replace:* $[c, d]$ *by* $[a, b]$

p. 265, Ex. 19.6/1b line 2 *replace:* $f(x)$ *by* $p(x)$ p. 289, Ans. 20.5/1: *read:* 1024

p. 307, Example 22.1C *read:* Show: as $n \rightarrow \infty$, $\frac{n}{1+nx} \dots$

p. 310, Theorem 22.B *read:* $\sum_0^\infty M_k$

p. 322, Ex. 22.1/3 *read:* $u_k(x) =$

p. 332, middle *delete both \aleph_1 , replace the second by $N(\mathbf{R})$*

p. 357, Theorem 24.7B, line 2 *read:* non-empty compact set S ; line 6 *read:* bounded and non-empty;

p. 385, line 2- *read:* \int_0^1

p. 404, Example A.1C(i): *read:* $a^2 + b^2 = c^2$