Errata for An Introduction To Analysis, Second Edition


This list was last updated on May 17, 2018, and is maintained by G. E. Keough, keough@bc.edu, who would greatly appreciate any reports of inaccuracies in the text.

First Printing.

Items are listed in order by page number.

7 Definition 1.2.1 is missing an important second condition, that for every \( a \in A \), there exists \( b \in B \) for which \((a, b) \in f\). Surprisingly, this error was present in the First Edition, but it was never reported.

14 Definition 1.3.2(b) should end with see Theorem 1.5.16 (not 1.5.14).

50 Exercise 8(c) was intended to be the sequence \( \{(1 + 1/n)^n\} \). This will make the hint more meaningful!

A student may ask “what is the limit?” At this point, while we do not want to prove anything more than existence, we expect to add the suggestion “For a discussion on this limit, see Problem 11 of Exercise Set 5.4.”

72 Line 5 of Paragraph 2: The indicated limit should be \( \lim_{x \to 0} \sin x/x = 1 \) (not the limit as \( n \to \infty \)).

The displayed equation 10 lines from the bottom of the page is missing an equal sign and should read

\[
|x - 3| < \delta = \varepsilon/5 \text{ implies } |f(x) - L| = 5|x - 3| < 5 \cdot \frac{\varepsilon}{5} = \varepsilon.
\]

93 Exercise 6 has a “0” where “\( f(0) \)” should appear. It should end with “For each, construct a sequence \( \{x_n\} \) such that \( x_n \to 0 \) and \( f(x_n) \neq f(0) \).” Note. Many different sequences \( \{x_n\} \) can be constructed as a solution, and it is not required that \( \{f(x_n)\} \) actually converge.

110 The heading “Sequences in \( \mathbb{R}^2 \)” should be left-aligned.

111 Definition 3.7.5 contains a one-character typesetting error and one important omission at the very end, and should be corrected to read: “\ldots the limit of \( f \) as \( p \) goes to \( p_0 \) \ldots if, for any \( \varepsilon > 0 \), there is a \( \delta > 0 \) such that \( |f(p) - L| < \varepsilon \) for all \( p \in D \) satisfying \( 0 < \|p - p_0\| < \delta \).

Note. Definition 3.7.5 does not require that \( f \) be defined in a deleted neighborhood of \( p \), although such a requirement is enforced in the one-variable case of Definition 3.1.1 on page 71.

116 Exercise 4: So that the student might correctly discover that Cauchy had no sons (as indicated on page 319), the following computation should be added as a sixth part of the Exercise (preferably as the first part):

\[
\lim_{{(x,y) \to (0,0)}} \frac{x^2y^2}{x^4 + y^4}
\]

126 Exercises 13(b) and 13(c) require that the product and chain rules learned in Calculus be assumed in advance of Section 4.2. Although
consistent with the introduction to the Chapter which stated that the reader “is probably already quite familiar with the results of this Chapter,” the reader may have the impression that all derivatives in this exercise set must be computed from definition, a task none of the authors had intended a student execute.

140 Exercise 24(b) should end with “... that \( f(1/(2n)) > f(1/(2n - 1)) \).”

176 The symbol \( m_J(f) \) appearing on the last line of the page should be defined as \( m_J(f) = \text{glb}_J f(x) \) (not \( \text{lub}_J f(x) \) as shown).

191 The reference on line −19 should be to “part (a) of Theorem 4.3.15” (not Theorem 4.4.4).

233 Definition 6.3.1 should be understood to assert that each of the expressions \( \sum_{n=0}^{\infty} a_n(x-x_0)^n \) and \( \sum_{n=0}^{\infty} a_n x^n \) represents a notational convenience for writing \( a_0 + a_1(x-x_0) + \ldots \) and \( a_0 + a_1 x + \ldots \), respectively. There should be no confusion in what follows about the meaning of either \( \sum_{n=0}^{\infty} a_n(x-x_0)^n \) when \( x = x_0 \), or \( \sum_{n=0}^{\infty} a_n x^n \) when \( x = 0 \).

245 Problem 8(e) may confuse the reader, given the language of the problem. If \( \sum_{n=0}^{\infty} n^3 a_n 3^n \) converges, then it is easy to show that \( \sum_{n=0}^{\infty} a_n 3^n / n^3 \) converges. No conclusion can be drawn about the radius of convergence since the assertions are untenable.

249 The third line from the bottom should read

\[ = \frac{1}{m!} f^{(m)}(x_0)(x-x_0)^m \]

315 The answer(s) for 11(b) should be \([-1, 1]\) and \((-\infty, \infty)\).