Changes to text in printings 1-7 (Intro. to Analysis – Mattuck)
(Changes to Exercises, Problems, Questions and Answers are in a separate list.)

To determine Printing: Printing 3 has 10 9 8 7 6 5 4 3 on the first left-hand page, e.g. .

Printing 1 involves all the items below; Printing 2 only those starting with 2 or 3;
Printings 3-7 only those starting with 3. (Printing 8 incorporates all of them.)

This list omits: minor English typos, minor mathematical typos if judged not confusing. (Printing 8 incorporates almost all of these too.)

Bullets mark the more significant small changes or corrections: missing or altered hypotheses, non-evident typos, new hints or simplifications; "line 5-"= fifth line from the bottom;
Double Bullets are used for more substantial additions or rewritings.

3 p. 10, Def. 1.6B: *read:* Any such C
1 p. 52, Example 4.2, Solution: *change:* $-u$ for u *to:* $-u$ for a.
3 p. 55, line 7: *read:* if $0 < |e_n| < .9$,
1 p. 55, line 11: *read:* e_0^4
3 p. 57, display (17): *read:* if $0 < |e_n| \le .2$
3 p. 63, display (9): *delete:* > 0
3 p. 63, line 11-: *read:* 5.1/4
1 p. 67, line 1: *read:* Example 5.2C
3 p. 68, line 10: *replace:* hypotheses *by:* symbols; *replace:* or *by:* and
3• p. 69, line 9: *read:* strictly increasing, clearly $n_1 \ge 1, n_2 \ge 2$, and so on, so eventually
  lines 11, 13: *replace:* $i \gg 1$ *by:* $i > N$
3 p. 73, line 2: *read:* $a_n - L$
3 p. 73, line 6-: *read:* and estimate it: use 2.4(4), and (16a), suitably applied to $\{b_n\}$.
3 p. 82, Proof (line 2): *change:* a_n *to* x_n
3 p. 95, display (6): *delete:* e
1 p. 104, Display (12). *change:* $f(n)$ *to* $f(n+1)$.
3 p. 104, line 10- *read:* $N + 1$
3 p. 106, line 10 *read:* $\sum(-1)^{n+1}/n$
3 p. 107, line 2 *insert after , :* this follows by E-6.1/1b or E-5.41a, or reasoning directly,
3 p. 108, bottom half through top p.109 *replace everywhere:* "positive" and "negative" by "non-negative" and "non-positive" respectively
3 p. 114, line 3- *replace:* $\le$ *by* $<$
3 p. 115, line 12- *read:* $|a_n| < 1$
3 p. 121, line 9 *read:* 8.4A

3•• p. 122 *The proof given mislabels the two key sums in line 11, and doesn't show the absolute convergence of* $\sum c_n$. *Fix it by replacing line 12 with:*
$= d_n - e_n$, where d_n and e_n are respectively the two positive series in the line above.
Then correct the rest by replacing everywhere c_n^+ *and* c_n^- *by* d_n *and* e_n *respectively.*

For the absolute convergence, insert the following before the final paragraph of the proof:
Since $\sum d_n$ and $\sum e_n$ are positive series, they are absolutely convergent, and

$$\sum |c_n| = \sum |d_n - e_n| \le \sum(|d_n| + |e_n|) = \sum d_n + \sum e_n,$$

which shows by the comparison theorem that $\sum c_n$ is also absolutely convergent.

3• p. 143, Example 10.3A and Solution. *in* $x^4 < x^2$, $x^3 < x^2$ *replace* $<$ *by* $\le$
3 p. 144, line 4- *read:* non-zero polynomial

3 p. 154, first line below pictures: *read:* points of discontinuity

3 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 everyone is somebody, then no one's anybody".

3 p. 156, line 4: *read:* In (8) below, the first limit exists if and only if the second and third exist and are equal;

3 p. 157, line 5: *read:* $x \ll -1$

3 p. 161, line 11: *delete ;* , line 12: *read* $<$, line 13 *read* $\le$

3• p. 164, *read:*

Thm. 11.4D′ *Let $x = g(t)$ and $g(I) \subseteq J$, where I is a t-interval, J an x-interval. Then $g(t)$ continuous on I and $f(x)$ continuous on $J \;\Rightarrow\; f(g(t))$ continuous on I.*

1• p. 166, Theorem 11.5A: *read:* $\lim\limits_{x\to a} f(x) = L$. *read:* $x_n \to a,\ x_n \ne a$

1• p. 166, Theorem 11.5B: *read:* $x_n \to a,\ x_n \ne a$

3 p. 203, Theorem 14.3B: *label:* Local Extremum Theorem

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

2• p. 208, line 13: *replace by:* then show this limit is 0 and finish the argument using (b).

1 p. 208, line 19: *change* fourteen *to* several

3 p. 221, line 11- *read:* (a, b)

3 p. 227, line 2: *read:* $f'(x)$ not convex

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

3 p. 235, display (15): *replace:* $0 < |c| < |x|$ *by:* $\begin{cases} 0 < c < x, \\ x < c < 0\ . \end{cases}$ *and delete next two lines*

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

3 p. 245 lines 1,2: $f(x_{i-1}))$, line 15: two underscripts: $[\Delta x_i]$

3•• p. 260, Defn. 19.6: *read:* $a = x_0 < x_1 < \ldots < x_{n-1} < x_n = b$, *and add at end:*

and has finite left and right limits at each x_i (just a finite one-sided limit at x_0, x_n). (Thus $f(x)$ can have discontinuities only at the x_i, and they are jump or removable.)

3• p. 261, Solution. *read:*

a) $\tan x$ is piecewise monotone with respect to $< 0, \pi/2, 3\pi/2, 2\pi >$, but not piecewise continuous since its limits at $\pi/2$ and $3\pi/2$ are not finite.

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

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

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

3 p. 273, line 2- : *read:* (cf. p. 271)

3 p. 282, line 2- : *read:* by interpreting the integral and limit geometrically

1 p. 294, line 6 from bottom: integral on the right is $\int_{a^+}^{b} g(x)\,dx$

3 p. 307, Example 22.1C *read:* Show: as $n \to \infty$, $\dfrac{n}{1+nx}$

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

1 p. 311, line 3-: *change 4 to 3b*

3 p. 316, Theorem 22.5A: *delete:* for all $n \ge 0$

1 p. 331, line 3: *change 21.1c to 23.1Ac*

3 p. 332, middle *delete both $\aleph_1$, replace the third display by:* $\aleph_0 = N(\mathbf{Z}) < N(S) < N(\mathbf{R})$

3 p. 335, lines 6-,7-: *read:* bounded and have only a finite number of jump discontinuities

3•• p. 340, *replace last 9 lines of text before Questions 23.4 with the following:*

Using Lebesgue integrals, simple versions of the Fundamental Theorems of Calculus are:

Second Fundamental Theorem. On I, if $f(x)$ is L-integrable and $F(x) = \displaystyle\int_a^x f(t)\,dt$, then $F'(x_0) = f(x_0)$ at any point $x_0 \in I$ where $f(x)$ is continuous.

First Fundamental Theorem. $\displaystyle\int_a^b F'(x)\,dx = F(b) - F(a)$, if $F(x)$ is differentiable on $[a,b]$ and $F'(x)$ is L-integrable. (For both statements, there are versions with weaker hypotheses, which use the "almost everywhere" notion somewhere in the statement.)

3 p. 350, line 10-: *read:* Subsequence Theorem 5.4
3 p. 351, line 5-: *read:* infinite quarter-planes containing the x-axis and lying between
3• p. 353, line 4-: *read:* 24.4A;
3 line 2-: *read:* $x + y = 2$
3 p. 354, Theorem 24.5B: *read:* for all $\mathbf{x}_n$
3 line 7- *read:* $f(\mathbf{x}_n)$
3 p. 357, Theorem 24.7B, line 2 *read:* non-empty compact set S;
3 line 6 *read:* bounded and non-empty;
3 p. 367, line 15- *add:* Or make up a simple direct proof.
3 p. 369, Theorem 25.3A: (i) *read:* then $S =$; (ii) *read:* $S = \bigcup_{i \in I} U_i$
3 p. 377, Example 26.2B, Solution line 2: *read:* $(-\infty, \infty)$ *change* $(*)$ *to* (5) *throughout*
3 p. 385, line 2- *read:* $\int_0^1$

3•• p. 388, footnote: *read:* The first inequality in (7) is the analog, for absolutely convergent improper integrals, of the infinite triangle inequality for sums (E-7.3/1). Its proof goes::

For a fixed x, we have by the Absolute Value Theorem for integrals (19.4C)

$$\left|\int_R^S f(x,t)\,dt\right| \le \int_R^S \left|f(x,t)\right| dt, \quad \text{for all } S > R,\ R \text{ fixed.}$$

As $S \to \infty$, the right side has the limit $\int_R^\infty |f(x,t)|\,dt$, since the integral $\int_R^\infty f(x,t)\,dt$ is assumed to be absolutely convergent.

The left side has the limit $|\int_R^\infty f(x,t)\,dt|$, since the integral is convergent (by theorem 21.4), and $|\ |$ is a continuous function.

Finally, by the Limit Location Theorem 11.3C (21), the inequality is preserved as $S \to \infty$.

1 p. 391, Th. 27.4A line 2: *replace* I *by* $[a,b]$
3 p. 399, line 18- *read:* $a(b+c) = ab + ac$
3 p. 404, Example A.1C(i): *read:* $a^2 + b^2 = c^2$
3•• p. 429 last 5 lines: *replace the sentences by:*

As the picture shows, since $|f'(x)| > 1.2$ on $[.7, 1]$, its reciprocal $|g'(x)|$ satisfies $|g'(x)| < 1/1.2 \approx .8$ on the interval $[0, f(.7)] = [0, .83]$.

This shows Pic-2 is satisfied for $g(x)$ on the interval $[0, .83]$; the picture shows the root of $x = g(x)$ will lie in this interval. Thus the Picard method can be used to solve $x = g(x)$. Starting with say .7, it leads to a root $\approx .76$.

3 p. 436, Remarks, first paragraph: *replace* x^3 *by* x^4
3 p. 439, top half: *change* p *and* q *to* P *and* Q (to avoid confusion with the use of the real number p in Example D.4)
3 p. 442, line 2: *read:* $\ge$ line 6: *read:* $\le$
3 p. 459, ruler function: *read:* 169