Errata and comments for **Fundamentals of Real Analysis**

(S. K. Berberian, 19 July 2009)

I am indebted to Patrice Goyer for signalling the items preceded by an asterisk.

p. 24, ℓ. 5, 6. Pending the 'official' definition of the field $\mathbb{R}$ of real numbers in §1.8 (p. 32), the notations for intervals and the term 'real line' are to be interpreted in the sense of, for example, pp. 9 and 31 of *First course*.

p. 25, ℓ. 1,2. A better notation: replace y by x' (and reserve the letter y for elements of Y).

*__p. 31,__ ℓ. −14. At the end of line, for $(r_k - r_n)$ read $(r_k - r_n)'$.

p. 47. To footnote 2, add a reference to Th. 4.7 on p. 20 of the book of Hewitt and Stromberg (*op. cit.*), from which the proof given here is drawn.

p. 48, ℓ. −5. In fact (assuming the Axiom of Choice) the ordering on the quotient set is a simple ordering (by Th. 1.11.12, as noted in Th. 1.12.19 below).

p. 58, ℓ. 14. For (GC) read (CH).

p. 75, ℓ. 11. For $b < \infty$ read $b < +\infty$.

p. 88, ℓ. 14. For "invertals" read "intervals".

p. 89, ℓ. 10. A proof of the Heine-Borel theorem is given in *First course* (p. 76, Th. 4.5.4), and repeated below in Theorem 6.1.1 on p. 273.

p. 92, Exer. 3 of §2.1. Hint: Th. 2.2.1.

*__p. 95,__ ℓ. 10. Replace "second inequality" by "second equality".

p. 98, ℓ. 1, 2. Hint: Th. 3 on p. 27 of *Measure and integration* (cited henceforth as M&I).

*__p. 101,__ ℓ. 19. Read (vi) instead of (iv).

*__p. 107,__ ℓ. 28. In the 2-line display of Exer. 5, delete the expression $< \frac{2}{3}\lambda(\mathrm{U}_m)$ at the end of the second line; thus the display should read:

$$\begin{aligned}\lambda(\mathrm{U}_m - \mathrm{A} \cap \mathrm{B}) &\leqslant \lambda(\mathrm{U}_m - \mathrm{A}) + \lambda(\mathrm{U}_m - \mathrm{B}) = 2\lambda(\mathrm{U}_m) - 2\lambda(\mathrm{A}) \\ &< 3\lambda(\mathrm{A}) - 2\lambda(\mathrm{A}) = \lambda(\mathrm{A})\end{aligned}$$

{If $\mathrm{A} \cap \mathrm{B}$ were empty, the resulting inequality $\lambda(\mathrm{U}_m) < \lambda(\mathrm{A})$ would contradict the fact that $\mathrm{A} \subset \mathrm{U}_m$.}

p. 108, Exercise 8, (ii). Hint: 2.2.3, (v).

***p. 112**. In lines -3 and -1, replace $\mathrm{E}_1 \cap \mathrm{E}_2$ by E_2. Thus line -1 becomes

$$\mu(\mathrm{F}_2) = \mu(\mathrm{E}_1 - \mathrm{E}_2) + \mu(\mathrm{E}_2) \leqslant \mu(\mathrm{E}_1) + \mu(\mathrm{E}_2)\,;$$

p. 124, ℓ. 12. If $(x_n)_{n\geqslant 1}$ is a sequence and $(n_k)_{k\geqslant 1}$ is a sequence of positive integers such that $n_1 < n_2 < n_3 < \ldots$, then the sequence $x_{n_1}, x_{n_2}, x_{n_3}, \ldots$ is called a subsequence of (x_n) and is denoted (x_{n_k}).

***p. 150,** ℓ. 1. For (ii) read (iii).

p. 156, ℓ. -4. To the reference at the end of Remark 4.2.2, (v), add 2.2.3, (v).

***p. 179,** ℓ. 21. At the end of the line, for "of $\mathrm{X} \times \mathrm{Y}$" read "of X and Y, respectively".

p. 183. In 4.6.10, by 'open interval in $\mathbb{R}$' is meant an open interval with endpoints in $\mathbb{R}$, hence the intervals $\mathrm{I} \in \mathscr{I}$ are bounded (*First course*, *Examples* 1.3.2 on p. 9). {In contrast, $\mathbb{R}$ is the open interval $(-\infty, +\infty)$ in $\overline{\mathbb{R}}$, but it is not an interval in $\mathbb{R}$.}

***p. 185,** ℓ. 14. For "form" read "from".

Trivialities

p. 43,**44.** In 1.11.9, read *Proof* #1 and *Proof* #2 (i.e., suppress the periods after the word *Proof*; they were added by the copy-editor).

p. 108, ℓ. 15. Remove the brace "}" at the end of the line (it was inserted by the copy-editor); the closing brace for the Hint is at the end of line 25 (the copy-editor did not worry about its opening brace).

p. 129, ℓ. 7. For "transfomations" read "transformations".

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