

# Real Analysis: Errata

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Some of the changes noted below have already been corrected in later printings.

**Page 21:**

In Theorem 1.13,  $R$  should be  $\mathbb{R}$ .

**Page 39:**

In the formula beginning  $a_{n+1}^2 - 2$ , the last inequality should be

$$\frac{(a_n^2 - 2)^2}{4a_n^2} > 0.$$

**Page 41:**

Lines 3 to 7 should read:

Since it is clear that, for all  $r \geq 1$ ,

$$r! = 1.2.3. \dots r \geq 2^{r-1},$$

it follows that

$$a_n < 1 + \sum_{r=1}^n 2^{1-r} < 1 + \frac{1}{1 - (1/2)} = 3.$$

**Page 108:**

Line 10 should read

$$\frac{f'(c)}{g'(c)} = \lambda = \frac{f(b) - f(a)}{g(b) - g(a)}.$$

**Page 111:**

In Line -8,  $f'(x) > 0$  should be  $f'(x) < 0$ .

**Page 119:**

After the definitions of  $M_i$  and  $m_i$ , it may be helpful to add a parenthetical remark:

(Notice incidentally that the supremum and infimum do not change if we use the *closed* interval  $[x_{i-1}, x_i]$ .)

**Page 122:** In Line 11,  $[x_{i-}, x_i]$  should be  $[x_{i-1}, x_i]$ .

**Page 133:**

Line 4 should read : Given two functions  $f$  and  $g$  defined ...

**Page 137:**

Line -2 should read  $= 2M(\mathcal{U}(f, D) - \mathcal{L}(f, D))$ .

**Page 156:**

Line 10 should read

$$1 - \frac{1}{2} + \frac{1}{3} - \dots .$$

Line -1 should read:  $\sum_{n=1}^{\infty} \phi(n)$  is convergent if and only if the integral  $\int_1^{\infty} \phi(x) dx$  is convergent.

**Page 184:**

The formula two lines below Figure 7.1 should be

$$\|f_n - f\| = \sup_{[0,1]} |f_n(x) - f(x)| \geq |f_n(p_n) - f(p_n)| = \frac{1}{2}.$$

**Page 186:**

In Line 10, it would be clearer to write  $\|f_n - f\| < \epsilon/(3(b-a))$ .

**Page 197:**

Theorem 7.18 should read: Let  $(f_n)$  be a sequence of functions with common domain  $[a, b]$ . Then  $\sum_{n=1}^{\infty} f_n$  is uniformly convergent in  $[a, b]$  if and only if for all  $\epsilon > 0$  there exists a natural number  $N$  such that

$$\left\| \sum_{r=n+1}^m f_r \right\| < \epsilon$$

for all  $m > n > N$ .

Also, in Theorem 7.19, 'function' should of course be 'functions', and Line -1 should be  $[a, b]$ .

For consistency, there should be a footnote: Karl Theodor Wilhelm Weierstrass, 1815–1897

**Page 205:**

Line 4 should read

$$\lim_{n \rightarrow \infty} \left| \frac{a_n}{a_{n+1}} \right| = \lim_{n \rightarrow \infty} \frac{n^n}{(n+1)^{n+1}} = \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^{-n} \cdot \frac{1}{n+1} \rightarrow e^{-1} \cdot 0 = 0.$$

**Page 211:**

The equation in Line 14 should read

$$f^{(n)}(x) = \alpha(\alpha-1) \cdots (\alpha-n+1)(1+x)x^{\alpha-n}.$$

**Page 217:**

The formulae (8.1) and (8.2) should read

$$\cos x = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!} = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \dots$$

and

$$\sin x = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!} = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots$$

**Page 229:**

For consistency, there should be a footnote for Wallis: John Wallis, 1616–1703

**Page 234:**

Again for consistency, there should be a footnote: Bartel Leendert van der Waerden, 1903–1996

**Page 242:**

In Exercise 2.23, Line 6,  $K$  should be  $k$ .

**Page 243:**

The solution of Exercise 2.31(e) has been omitted:

(e) False. Consider  $a_n = 1/n$ .

**Page 262:**

The displayed formula in Exercise 7.1(c) should be

$$\left| \frac{1}{f_n(x)} - \frac{1}{f(x)} \right| = \frac{|f_n(x) - f(x)|}{|f_n(x)f(x)|} < \epsilon.$$



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