

CORRECTIONS TO CALCULUS FOR THE AMBITIOUS

T.W.KÖRNER

The first correction received was from Justin Turner. The biggest lists of corrections came from Nick Lord and Robert Burkel. Other corrections came from Bradford Scow, Daniel Worall, Mathew Warren, Chris Phillips and Richard Trimble. The author owes a substantial debt of gratitude to everyone who took the trouble to notify him of errors.

The reader should remember that lists of errata may themselves contain errors.

Page 2, line 2

Replace 'to to' by 'to'.

Page 2, midway and page 163 reference [5]

E. A. Maxwell

Page 2, footnote ²

Sketch solutions to most of the exercises together with a list of errata can be found on my home page <http://www.dpmms.cam.ac.uk/~twk/>. I have marked a few exercises with a ●. These are less central to the exposition. Some of them are quite long or require some thought.

Page 9 last but one displayed equation

Replace $\frac{\sqrt{A}}{2}$ by $\frac{A}{2}$

Page 18 line 4 Replace

$$u_2(t) = ag'(t) + bf'(t) = f(t)g(t) + g(t)f(t)$$

by

$$u_2(t) = ag(t) + bf(t) = f(t)g(t) + g(t)f(t)$$

Page 27, lines 15 to 16 The sentence beginning No one starts in the singular, wanders along and ends in the plural. Robert Burkel suggests in accordance with ‘your missionary zeal’ ‘unless they have done it themselves.’ should read ‘unless she has done it herself.

Page 33, 4th displayed formula, beginning ‘But’

$$N(f)s^2 \leq A(f) \leq M(f)s^2, \quad N(g)s^2 \leq A(g) \leq M(g)s^2$$

Page 39, first displayed inequation of Exercise 2.2.11 (vi)

$$\int_{ra/n}^{(r+1)a/n} \frac{r^2 a^2}{n^2} dt \leq \int_{ra/n}^{(r+1)a/n} t^2 dt \leq \int_{ra/n}^{(r+1)a/n} \frac{(r+1)^2 a^2}{n^2} dt$$

Page 49, line 1

insert ‘to’ ‘run to the point’

Page 50, fifth line from bottom

$c \leq t \leq c - u$ should read $c \leq t \leq c + u$

Page 56, Exercise 3.1.1, end of last sentence

$$G(x) = F(x) - F(0)$$

Page 60, line -2

Replace y by $1/y$

If this ratio is called $1/y$

Page 65, third displayed inequation

Replace $2^{-1/2}$ by $2^{1/2}$ twice.

Page 70, first line of part (iii)

if n and m are positive integers

Page 73, first line of Exercise 4.4.1

The condition $y(0) = 0$ is irrelevant so better to have

Suppose that $y'(0) = 0$.

Page 75, Exercise 4.1.5 second line

Equation should read $y = C(x + A)^2 - B$

Page 78, last displayed equation

$$u(t) = A \exp at - \frac{C}{a}$$

Page 83, second line of Exercise 4.3.4 (ii)

Replace x_t by $x(t)$

Page 83, at end of Exercise 4.3.5

Add Notice that the presence of an exponential factor implies that atmospheric pressure will drop off very rapidly with height.

Page 86 Exercise 5.1.6

The condition $a > 0$ is otiose.

Show that we can take $M = \exp(a + 1)$.

Page 86, Exercise 5.1.7

Remove the two % signs in the last sentence to get $c = 3$ and $c = 4$

Page 91, third line of Exercise 5.3.3

Remove intrusive a to get from n bracketed pairs

Page 97 line 4

the measurement will be considerably

Page 101 line 1 first expression

$$(f''(a)/2!)h^2$$

Page 101 line -5

Replace $r \geq 2$ by $r \geq 3$.

Note that, if $r \geq 3$,

Page 102 line 10, displayed equation

Replace 1 by t^{n-1} in appropriate fraction.

$$\left| E(t) - 1 - \frac{t}{1!} - \frac{t^2}{2!} - \dots - \frac{t^{n-1}}{(n-1)!} \right| \leq E(a) \frac{|t|^n}{n!}$$

Page 103, Exercise 6.3.5 Replace the reference to Exercise 5.1.7 by

This exercise improves the result stated just after Exercise 5.1.6.

Page 103 last equation and page 104 first equation

Replace $\left(1 + \frac{a}{N} + \frac{a^2}{N^2}\right)$ by $\left(1 + \frac{a}{N} + \frac{a^2}{2N^2}\right)$

Page 122, end of third line of first set of equations

Replace $\cos \theta) \sin \theta$ by $\sin \theta) \sin \theta$

Page 123 line -1

ch^2 should be ck^2

$$g(h, k) = C + (Ak + Bh) + \frac{1}{2}(ah^2 + 2bhk + ck^2) + o(h^2 + k^2)$$

Page 125 line 6

replace 'to straight' by 'the straight'

Page 132 lines -4, -3, -2

Replace all three occurrences of $f(y(rh), h)$ by $f(y(rh), rh)$ to get

$$\begin{aligned} |e_{r+1}| &= |y((r+1)h) - y_{r+1}| = |e_r + (y((r+1)h) - y(rh)) + (y_r - y_{r+1})| \\ &= |e_r + (y((r+1)h) - y(rh)) - hf(y_r, rh)| \\ &= |e_r + (y((r+1)h) - y(rh) - hf(y(rh), rh)) + h(f(y(rh), rh) - f(y_r, rh))| \\ &\leq |e_r| + |y((r+1)h) - y(rh) - hf(y(rh), rh)| \\ &\quad + |h||f(y(rh), rh) - f(y_r, rh)|. \end{aligned}$$

Page 133 lines 3

Replace final line by final expression

Page 134 line 7

Replace a by T

error $y(T) - y_N = e_N$

Page 134 line -6

Remove wandering 'a'

you should tabulate

Page 134 line -2

replace y by r in range

computing y_r for $0 \leq r \leq 20$

Page 137 lines 4 and 5

Single the doubled ‘method’

direct mid-point method for step size

Page 137 first two lines of footnote

Get the grammar of the square bracket right

[on the student if he performs the experiment himself]

Page 138, end of Exercise 9.3.5

Add the following sentence:- Show that $0 < p < 1$.

Page 139 first line

The initial condition should be $y_0 = 1$

Thus if $y_0 = 1$, $y_1 = p$ and we solve our equations *exactly*,

Page 143, penultimate line Exercise 10.1.4 (ii)

Replace stammer by $G^{(2r-1)}(0) = 0$ and $G^{(2r)}(0) = (-1)^r$

Page 143, last displayed equation Exercise 10.1.5 (ii)

$$R_n(G_a, x) = \frac{(-1)^{m+1} x^{2m+2}}{a^{2m+2}} \frac{a^2}{a^2 + x^2}.$$

Page 149 line 8

This reads better as

It is doubtful whether any of them knew

Page 162, line 10

Replace ‘at the this’ by ‘at this’.