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Errata List (Fourth Printing)

Numerical Mathematics and Computing, 4th Edition
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items (•) to be corrected.

items (√) corrected in previous printings [current printing #5].

- (Page 3, Line -6) Insert colon to read:
`with(numapprox):`

- (Pages 24-25) In Maple, the constant identifier for π is `Pi` with the first letter capital. In the Maple code, change `pi` to `Pi` eight times on page 24 and twice on page 25.

√ (Page 35, Problem 1.2.9) In line 2, change "Cancellation" to "Loss". In line 3, change "circumventing" to "reducing". In line 4, change "difficulty" to "error" and omit "of this type of difficulty." Insert at end of problem, "Try high-precision computer arithmetic to see how bad the floating-point errors can be." To read:

9. (Continuation) If $x < 0$ in the preceding problem, what are the signs of the terms in the series? Loss of significant digits can be a serious problem in using the series. Will the formula $e^{-x} = 1/e^x$ be helfpul in reducing the error? Explain. (See Section 2.3 for further discussion.) Try high-precision computer arithmetic to see how bad the floating-point errors can be.

- (page 60, Example 3, Solution, second word) The binary representation of the second word is missing a bit in the third nibble from the left—the low-order bit of that nibble is missing and should be 1 to read:

$$[1011\,1010\,0011\,1001\,0000\,0000\,0000\,0000]_2$$

- (page 62, line −11 above Table 2.2) Rewrite to read:
bit strings of all ones in the exponent field except for possibly the sign bit together with all zeros in the mantissa field.

- (page 63, Table 2.3, righthand column, line −2) Replace = 1 with = 0 to read:
$\pm\infty \quad b_{10} = b_{11} = \cdots = b_{32} = 0$

- (page 176, 2nd paragraph, line 2) Replace exponent $2m$ with $2m + 2$ to read:
$(h/2^n)^{2m+2}$. Since $h/2^n$ is small, this indicates that ...

- (page 183, Problem 4.3.20, line 1) Change $\lim_{h\to p}$ to $\lim_{h\to 0}$
- (page 233, Example 3, Solution)

  (line 7 from top of page) Insert $\frac{1}{2}$ twice to read:

  $$= \frac{1}{2}\left[\frac{5}{9}f\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{3}{5}}\right)+\frac{8}{9}f\left(\frac{1}{2}\right)+\frac{5}{9}f\left(\frac{1}{2}+\frac{1}{2}\sqrt{\frac{3}{5}}\right)\right]$$

  (line 9 from top of page) Change exponent in last two terms to read:

  $$\int_0^1 e^{-x^2}\,dx \approx \frac{5}{18}e^{-0.11270\,1665^2}+\frac{4}{9}e^{-0.5^2}+\frac{5}{18}e^{-0.88729\,8335^2}$$

- (page 238, Computer Problem 5.5.6) In displayed equation, change $e^{-\pi}$ to e^{-x}.
- (page 267, Problem 6.2.9) In displayed equation, change x to x_1 (three times) to read:

  $$\begin{cases} 2x_1 + 3x_2 \phantom{{}-x_3} = 8 \\ -x_1 + 2x_2 - x_3 = 0 \\ 3x_1 \phantom{{}+2x_2} + 2x_3 = 9 \end{cases}$$

- (page 299, Problem 6.4.5a) In last line, change $\boldsymbol{LU} = \boldsymbol{U}$ to $\boldsymbol{MA} = \boldsymbol{U}$.
- (page 327, Problem 7.1.9) Add to last line: *Hint:* Use Problem 7.
- (page 402, 2nd displayed eqn, 2nd eqn) Change $-249G(t-2h)]$ to $+G(t-2h)]$ in last term.
- (page 413, line 4) Replace a with h to read:
  $t \leftarrow t + h$
- (page 427, Problem 9.2.13) Remove extra / at the end of the first displayed equation to read:
  $txyz + x'y'/t = tx^2 + x/y'' + z$

√ (p. 464, first displayed equation) Change subscript on matrix $\mathbf{D} = [\cdots]$ from $m \times m$ to $m \times n$

$$D_{m\times n}$$

- (Page 533, line after Equation (6)) Change $O(h)$ to $O(k)$

√ (Page 542, Equation (13), line 2) Change "$u = 1$" to "$u = q$" to read:

$$u = q \qquad \text{on the boundary of } R$$

- √ (Page 542, line 1 after Equation (13)) Insert "where $q = \frac{1}{2}[\cosh(5x) + \cosh(5y)]/\cosh(5)$." and replace "$u = \frac{1}{2}[\cosh(5x) + \cosh(5y)]/\cosh(5)$" with $u = q$. Thus, the first line after Equation (13) reads:

  where $q = \frac{1}{2}[\cosh(5x) + \cosh(5y)]/\cosh(5)$. This problem has the known solution $u = q$.

- √ (Page 543, last line on page) Change "Problem" to "boundary-value problem" to read:

  which differ from the known solution of boundary-value problem (13) by

- • (Page 550, FIGURE 14.2 caption) Change sin(53) to $\sin(53x)$ to read:

  $F(x) = x^2 + \sin(53x)$

- √ (p. 560, Problem 14.1.7, last line) Change "(9) and (10)" to "(10) and (11)" to read:

  ... with Equations (10) and (11) in Section 3.3.

- √ (Page 572, line −5) Change "using using" to "using" to read:

  $F(x_0)$, *shrink* the simplex by using $x_i \leftarrow \frac{1}{2}(x_i + x_n)$ for ...

- √ (Page 616, line 2, PROPERTIES 2.) Change "$0a = 0$" to "$a\mathbf{0} = \mathbf{0}$ for $a \in \mathbb{R}$" to read:

  2. $0\mathbf{x} = \mathbf{0}$ and $a\mathbf{0} = \mathbf{0}$ for $a \in \mathbb{R}$. (Notice the different zeros here!)

- √ (p. 648, Computer Problems 11.2, Answer 4) Change "$\frac{4}{3}\pi$" to "8" to read:

  4. 8

- √ (Bibliography, p. 654, line 8, Borwein and Borwein) Change "*Reviews*" to "*Review*"

  ... *Society for Industrial and Applied Mathematics Review* ...

- √ (Bibliography, p. 656, line −7, Hull and Dobell) Change "*Journal on Applied Mathematics*" to "*Review*" to read:

  ... *Society for Industrial and Applied Mathematics Review* ...

- √ (Bibliography, p. 659, line −10, Torczon) Change "*SIAM J. Optim.* **7** to appear." to "*Society for Industrial and Applied Mathematics Journal on Optimization* **7**, 1–25."

- √ (Bibliography, p. 660, line −2, Ypma) Change "*SIAM Review*" to "*Society for Industrial and Applied Mathematics Review*"