Errata for the 32nd edition of *Standard Mathematical Tables and Formulae*

LAST UPDATED: August 20, 2017

NOTES:

- The latest errata is available from http://www.mathtable.com/smtf/ and http://www.mathtable.com/errata/.

ERRATA:

1 **PREFACE**, page xii. The web addrress "smtf.mathtable.com" should have been "www.mathtable.com/smtf/".

(Thanks to Michael Somos for correcting this error.)

2 **NEGATIVE INTEGER POWERS**, **1.3.10**, page 20. The first line now has

it is defined for $\operatorname{Re} k > 1$

This is incorrect, it should have been

it is defined for $\operatorname{Re} n > 1$

(Thanks to Martin Gotz for correcting this error.)

3 **p-ADIC NUMBERS**, **1.3.12**, page 23. The sentence beginning

The number $\frac{140}{297} = 2^2 \cdot 3^{-3} \cdot 5 \cdot 7 \cdot^{-11}$

should have been

The number $\frac{140}{297} = 2^2 \cdot 3^{-3} \cdot 5 \cdot 7 \cdot 11^{-1}$

(Thanks to Emory Villines for correcting this error.)

4 **DIOPHANTINE EQUATIONS**, **1.4.4.7**, page 28.

- The phrase "has a unique solution for $n \geq 3$" should be changed to "has a unique solution, with x and y odd, for $n \geq 3$"
- The solution, written as

$$x = \frac{2^{n/2+1}}{\sqrt{7}} \left|\sin\left(n \tan^{-1}\sqrt{7}\right)\right| \qquad y = 2^{n/2}\left|\cos\left(n \tan^{-1}\sqrt{7}\right)\right|$$

is incorrect. It should have been

$$x = \frac{2^{n/2}}{\sqrt{7}} \left|\sin\left([n-2] \tan^{-1}\sqrt{7}\right)\right| \qquad y = 2^{n/2}\left|\cos\left([n-2] \tan^{-1}\sqrt{7}\right)\right|$$

(Thanks to Tim Cross for correcting these errors.)

5 **Pythagorean triples**, **1.4.4.1**, page 29. The last number in the second to last row should be 53, not 51.

(Thanks to Richard Sullivan for correcting this error.)

6 **Miscellaneous Sums** **1.5.11**, page 59. The value shown, 38.43, is incorrect, it should have been 38.41.

A derivation is in the paper: Richard J. Mathar, "The series limit of $\sum_k 1/[k \log k (\log\log k)^2]$", `https://arxiv.org/abs/0902.0789`

(Thanks to Richard J. Mathar for correcting this error.)

7 **Roots of polynomials**, **2.1.2.5**, page 65. The attribution "*Viete's formulas*" should have been "*Vieta's formulas*".

(Thanks to Michael Somos for correcting this error.)

8 **CUBIC POLYNOMIALS**, **2.2.2**, page 68. The first line now includes

$$ax^3 + bx^2 + cx + d = 0,$$

this should have been

$$x^3 + bx^2 + cx + d = 0$$

(Thanks to Bob Hackenberg for correcting this error.)

9 **CUBIC POLYNOMIALS**, **2.2.2**, page 68. The formula

$$K = a\cos(-G/2I)$$

should have been

$$K = \cos^{-1}(-G/2I)$$

(Thanks to Michael Somos for correcting this error.)

10 **DOT, SCALAR, OR INNER PRODUCT**, **2.3.6**, page 74. The first line now has

> The *dot* (or *scalar* or *inner product*) of

This is incorrect, it should have been

> The *dot* (or *scalar* or *inner*) *product* of

(Thanks to Won-seok Lihh for correcting this error.)

11 **VECTOR OR CROSS PRODUCT**, **2.3.7**, page 75. Item 1 now begins

> The *vector* (or *cross product*) of

This is incorrect, it should have been

> The *vector* (or *cross*) *product* of

(Thanks to Won-seok Lihh for correcting this error.)

12 **CATALAN NUMBERS** **3.2.6**, page 137.

(a) The table is incorrect since the indexing is off. Instead of

n	0	1	2	3	4	5	6	7	8	9	10
C_n	$\frac{1}{2}$	1	1	2	5	14	42	132	429	1430	4862

The correct values are

n	0	1	2	3	4	5	6	7	8	9	10
C_n	1	1	2	5	14	42	132	429	1430	4,862	16,796

(b) In the EXAMPLE: C_n should be replaced with C_{n-1} and "$C_4 = 5$" should be replaced by "$C_3 = 5$".

(Thanks to Michael Somos for correcting these errors.)

13 **QUADRILATERALS** **Section 4.6.2**, page 210. The formula

$$\text{area} = \sqrt{(s-a)(s-b)(s-c)(s-d) - abcd\cos\frac{1}{2}(A+C)}$$

is incorrect; it should have been

$$\text{area} = \sqrt{(s-a)(s-b)(s-c)(s-d) - abcd\cos^2\left[\frac{1}{2}(A+C)\right]}$$

(Thanks to Jan Van Casteren for correcting this error.)

14 **ADDITIONAL PROPERTIES OF ELLIPSES** **Section 4.10.3**, page 227.

There is currently the incorrect statement

> The *area* of the shaded sector on the right is $\frac{1}{2}ab\theta = \frac{1}{2}ab\cos^{-1}(x/a)$.

This should have been

> The *area* of the shaded sector on the right is $\frac{1}{2}ab\tan^{-1}\left(\frac{a}{b}\tan\theta\right)$.

(Thanks to J. Leland Langston for correcting this error.)

15 **SYMMETRIES: CARTESIAN COORDINATES** **Section 4.13.1**, page 245.

The Rotation matrix is confusing since $\{a, b, c, \alpha\}$ are used in two different senses when comparing to the direction cosines on page 249.

Hence, replace

> *Rotation* through α (counterclockwise) around the line through the origin with direction cosines a, b, c (see page 249):

with

> *Rotation* through α (counterclockwise) around the line through the origin with direction cosines a, b, c (so that $a^2 + b^2 + c^2 = 1$, see page 249):

(Thanks to Mark F. Kruelle for correcting this error.)

16 **VECTOR CALCULUS** **Section 5.1.10**, page 275.

(a) In item 13, the partial derivatives ∂ should be full derivatives (d)

(b) In item 13 c, the right had side is incorrect. It is now $-A\frac{dA}{dt}A^{-1}$. It is should have been $-A^{-1}\frac{dA}{dt}A^{-1}$.

(Thanks to John Gibb for identifying this error.)

17 **APPLICATIONS OF INTEGRATION** **Section 5.3.4**, page 284.

2.c is incorrect; it uses ϕ and not θ. Replace

$$s = \int_{\theta_1}^{\theta_2} \sqrt{r^2 + \left(\frac{dr}{d\phi}\right)^2}\, d\theta = \int_{r_1}^{r_2} \sqrt{1 + r^2 \left(\frac{dr}{d\phi}\right)^2}\, dr \text{ for } r = f(\theta).$$

with

$$s = \int_{\theta_1}^{\theta_2} \sqrt{r^2 + \left(\frac{dr}{d\theta}\right)^2}\, d\theta = \int_{r_1}^{r_2} \sqrt{1 + r^2 \left(\frac{dr}{d\theta}\right)^2}\, dr \text{ for } r = f(\theta).$$

(Thanks to Martin Naumer and Mark Leifer for independently identifying this error.)

18 **Section 5.4.21 BESSEL FUNCTIONS**, page 329.

The line

> $Z_p(x)$ represents any of the Bessel functions $\{J_p(x),\, Y_p(x),\, K_p(x),\, I_p(x)\}$.

is incorrect. It should have been

> $Z_p(x)$ represents any of the Bessel functions $\{J_p(x),\, Y_p(x),\, e^{p\pi i}K_p(x),\, I_p(x)\}$.

(Thanks to David Billinghurst for correcting this error.)

19 **Integral 631**, **Section 5.5**, page 332. The evaluation of the integral is given as

$$\frac{1}{2}B\left(\frac{n}{2}\right)\frac{m}{2}$$

which is incorrect, it should have been

$$\frac{1}{2}B\left(\frac{n}{2}, \frac{m}{2}\right)$$

(Thanks to Roger Nelsen for correcting this error.)

20 **Integral 686**, **Section 5.5**, page 335. The integral is given as

$$\int_0^1 \frac{dx}{\sqrt{\log(-\log x)}} = \sqrt{\pi}$$

which is incorrect, it should have been

$$\int_0^1 \frac{dx}{\sqrt{-\log x}} = \sqrt{\pi}$$

(Thanks to Mike Fisher for correcting this error.)

21 **RATIONAL TRIGONOMETRY Section 6.5.15**, page 411.

Equation (6.5.6) is incorrect. Replace

$$(Q_{12} + Q_{23} + Q_{12})^2 = 2\left(Q_{12}^2 + Q_{23}^2 + Q_{12}^2\right)$$

with

$$(Q_{12} + Q_{23} + Q_{13})^2 = 2\left(Q_{12}^2 + Q_{23}^2 + Q_{13}^2\right)$$

22 **AIRY FUNCTIONS Section 6.22.15**, page 460.

The values of c_1 and c_2 are incorrect. Replace

$$\begin{aligned} c_1 &= \quad \mathrm{Ai}(0) \ = \mathrm{Bi}(0)/\sqrt{3} \ = 3^{-2/3}\Gamma(\tfrac{2}{3}) = 0.35502\,80538\,87817\,, \\ c_2 &= -\,\mathrm{Ai}'(0) = \mathrm{Bi}'(0)/\sqrt{3} = 3^{-1/3}\Gamma(\tfrac{1}{3}) = 0.25881\,94037\,92807\,. \end{aligned}$$

with

$$\begin{aligned} c_1 &= \quad \mathrm{Ai}(0) \ = \frac{\mathrm{Bi}(0)}{\sqrt{3}} = \frac{3^{-2/3}}{\Gamma(\frac{2}{3})} = 0.35502\,80538\,87817\,, \\ c_2 &= -\,\mathrm{Ai}'(0) = \frac{\mathrm{Bi}'(0)}{\sqrt{3}} = \frac{3^{-1/3}}{\Gamma(\frac{1}{3})} = 0.25881\,94037\,92807\,. \end{aligned}$$

(Thanks to Thomas Ulrich for correcting this error.)

23 **RANDOM SUM OF RANDOM VARIABLES Section 7.1.8**, page 518.

The formula

$$\sigma_T^2 = \mu_N \sigma_X^2 + \mu_X \sigma_N^2$$

should have been

$$\sigma_T^2 = \mu_N \sigma_X^2 + \mu_X^2 \sigma_N^2$$

(Thanks to William W. Sampson for correcting this error.)

24 **COUPON COLLECTORS PROBLEM Section 7.2.2**, page 519.

(a) It would be better to give more terms in the asymptotic result. Replace

As $n \to \infty$, $\mathrm{E}[W_{n,n}] \sim n \log n$.

with

As $n \to \infty$, $\mathrm{E}[W_{n,n}] \sim n \log n + \gamma n + \frac{1}{2}$.

(b) The numerical values are for the standard deviation, not the variance. Replace

n	2	5	10	50	100	200
$\mathrm{E}[W_{n,n}]$	3	11.4	29.3	225	519	1,176
$\mathrm{Var}[W_{n,n}]$	1.4	5.0	11.2	62	126	254

with

n	2	5	10	50	100	200
$\mathrm{E}[W_{n,n}]$	3	11.4	29.3	225	519	1,176
$\sigma_{n.n} = \sqrt{\mathrm{Var}[W_{n,n}]}$	1.4	5.0	11.2	62	126	254

(Thanks to Paul Johnson for correcting these errors.)

25 **Critical Values 7.15.1**, page 598.

The integral presently has an upper limit of "∞"; this is incorrect. The upper limit should be "z".

(Thanks to Joseph J. Rushanan for correcting this error.)

26 **Computational Moledules**, **8.3.2.2**, page 650.

The molecule in part "(e)" is incorrect; the 0's on the spokes should be 1's.

(Thanks to Lucas Wilkins for correcting this error.)

27 **Reference Sites 10.8.3**, page 710.

The `arxiv.org/archive/math` site is no longer hosted at Los Alamos National Lab; it is now hosted at Cornell University.

(Thanks to Michael Somos for correcting this error.)

28 **MISCELLANEOUS CONVERSIONS Section 10.21.7**, page 759. Line 15 of the table is currently

Multiply "atmospheres" by "2.036" to obtain "inches of mercury at 0°C"

this is incorrect. The line should have been

Multiply "atmospheres" by "29.92" to obtain "inches of mercury at 0°C"

(Thanks to David Quam for correcting this error.)

29 **PHYSICAL CONSTANTS Section 10.21.8**, page 759.

Item 5 lists Avogadro's constant as 6.022142 mol^{-1}, which is incorrect. The correct value is 6.022142×10^{23}.

(Thanks to Jerry Caplin for correcting this error.)