

Errata for the 33rd edition of *Standard Mathematical Tables and Formulae*

UPDATED: September 21, 2024

NOTES:

- The latest errata are here: http://www.mathtable.com/errata/smtf33_errata.pdf
- The home page for this book is <http://www.mathtable.com/smtf/>.
- Please send errata to ZwillingerBooks@gmail.com.
- We thank everyone who has contacted us about errors in this book!

ERRATA:

1 GENERAL PROPERTIES 1.9.2-9, page 48.

9/2024

The name Holder should be Hölder

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

2 Telescoping series 1.9.4.3, page 51.

9/2024

The name Saalschutz should be Saalschütz

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

3 Hypergeometric series 1.9.4.5, page 51.

9/2024

The name Saalschutz should be Saalschütz

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

4 VECTOR OR CROSS-PRODUCT 2.3.7, page 81.

The first line now has

The vector, (or cross-) product) of

This is incorrect. It should have been

The vector, (or cross-) product of

(Thanks to Roger Nelsen for correcting this error.)

5 DEFINITIONS 4.1, page 147.

Item #22, for the *Hermitian conjugate*, currently has

$(A^H)_{kl} = u_{lk} - iv_{ik}$ which is incorrect. It should have been

$(A^H)_{kl} = u_{lk} - iv_{lk}$ That is $v_{ik} \rightarrow v_{lk}$.

(Thanks to Toshio Iguchi for correcting this error.)

6 Properties of Stirling cycle numbers 3.2.9.1-1, page 146.

The current

$\begin{bmatrix} n \\ k \end{bmatrix} = (n-1) \begin{bmatrix} n-1 \\ k \end{bmatrix} + n \begin{bmatrix} n-1 \\ k-1 \end{bmatrix}$ is incorrect. It should have been

$\begin{bmatrix} n \\ k \end{bmatrix} = (n-1) \begin{bmatrix} n-1 \\ k \end{bmatrix} + \begin{bmatrix} n-1 \\ k-1 \end{bmatrix}$

(Thanks to Alain Houde for correcting this error.)

7 QUADRILATERALS 4.7.2, page 217.

(a) The fourth line from the bottom now has

$$p = \sqrt{\frac{(ac+bd)(ab+cd)}{(ad+bc)}}$$

This is correct, but incomplete; it should have included the analogous expression for q :

$$p = \sqrt{\frac{(ac+bd)(ab+cd)}{(ad+bc)}}, \quad q = \sqrt{\frac{(ac+bd)(ad+bc)}{(ab+cd)}}$$

(b) The bottom line now has

$$pq = ac + bd \text{ (Ptolemy)}$$

This is correct, but incomplete; it should have included the additional expression:

$$pq = ac + bd \quad \text{and} \quad \frac{p}{q} = \frac{ab+cd}{ad+bc} \quad \text{(Ptolemy)}$$

(Thanks to Roger Nelsen for these improvements.)

8 COMMON LIMITS 5.1.10, page 282.

One of the limits is incorrect.

$$7. \quad \lim_{x \rightarrow 0} \frac{1 - \cos x}{x} = \frac{1}{2}$$

is incorrect, it should have been

$$7. \quad \lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2} = \frac{1}{2}$$

(Thanks to Andrew Melendrez Zerwekh for correcting this error.)

9 Example: paraboloid of revolution 4.22.2.3, page 274.

(a) The *Equation for principal directions* (#7) has a minus sign error in the unfactored term.

The first line now ends $+uv dv^2 = 0$ which is incorrect.

The corrected term is $-uv dv^2 = 0$

(b) The *Lines of curvature* (#8) has two errors:

- $u dv + v dv = 0$ should be $u du + v dv = 0$

- $v du - v du = 0$ should be $v du - u dv = 0$

(Thanks to Dan Martin for correcting these errors.)

10 APPLICATIONS OF INTEGRATION 5.3.3, page 294.

Currently, in section 2 (c), there is

$$\int_{r_1}^{r_2} \sqrt{1 + r^2 \left(\frac{dr}{d\theta}\right)^2} dr$$

which is incorrect, it should have been

$$\int_{r_1}^{r_2} \sqrt{1 + r^2 \left(\frac{d\theta}{dr}\right)^2} dr$$

(Thanks to Martin Naumer for correcting this error.)

11 TABLE OF DEFINITE INTEGRALS 5.5, page 343.

Currently, the second (reformulated) integral in #596 is missing the dx term.

(Thanks to Toshio Iguchi for correcting this error.)

12 SIGNIFICANT MATHEMATICAL EQUATIONS 5.14, page 417.

The Einstein equation now has the term

$$\frac{8\pi G}{\pi^4} T_{\mu\nu}$$

which is incorrect, it should have been

$$\frac{8\pi G}{c^4} T_{\mu\nu}$$

13 SUMS OF CIRCULAR FUNCTIONS 6.5.13, page 431.

Line 4 currently has $\sin \alpha \pm \beta$ and $\sin \beta \pm \alpha$

These should have been written as $\sin(\alpha \pm \beta)$ and $\sin(\beta \pm \alpha)$

(Thanks to Roger Nelsen for these clarifications.)

14 RATIONAL TRIGONOMETRY 6.5.15, page 432.

Equation (6.5.6) now ends with $+Q_{12}^2$) which is incorrect.

The correct term is $+Q_{13}^2$)

(Thanks to Alain Houde for correcting this error.)

15 GUDERMANNIAN FUNCTION 6.12, page 449.

The figure at the top of this page has the x axis label combined with the first line of text. Hence, “hyperbolic x function” should have been “hyperbolic function”

(Thanks to Dan Martin for correcting this error.)

16 SUM AND DIFFERENCE OF FUNCTIONS 6.10.11, page 446.

9/2024

The sum and difference formula for the arctanh function is incorrect. It now says

$$\tanh^{-1} x \pm \tanh^{-1} y = \tanh^{-1} \left(\frac{x \pm y}{xy \pm 1} \right)$$

which is incorrect. The correct formula is

$$\tanh^{-1} x \pm \tanh^{-1} y = \tanh^{-1} \left(\frac{x \pm y}{1 \pm xy} \right)$$

(Thanks to Patrick M. Murphy for correcting this error.)

This mistake appears in earlier editions: 30th (page 483), 31st (page 529), 32nd (page 421).

17 NUMERICAL VALUES OF THE ELLIPTIC INTEGRALS 6.17.2, page 472.

9/2024

For the first two tables, the variables in those tables could be clarified by replacing

ϕ	α	
	0°	10° ...
0°	0.0000	...
10°	...	\ddots

with

$\phi \backslash \alpha$	0°	10° ...
0°	0.0000	...
10°	...	\ddots

(Thanks to Richard J. Mathar for this improvement.)

18 Finite cosine transform 6.41, page 518.

9/2024

Transform #8 now has

$$\frac{(-1)^n e^{c\pi} - 1}{n^2 + c^2}$$

which is incorrect. It should be

$$\frac{(-1)^n e^{c\pi} - 1}{n^2 + c^2}$$

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

19 PERCENTAGE POINTS, STUDENT'S *t*-DISTRIBUTION 7.17.3, page 631.

The example gives the value 0.325 in two places, that value should have been 0.289.

(Thanks to Emanuele Cosulich and Howard Edinger for independently correcting this error.)

20 ACOUSTICS 9.1, page 691.

9/2024

The units are missing for the variables T . It should say

- T sound duration (sec)

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

21 ASTROPHYSICS 9.2, page 693.

9/2024

Regarding the Earth and the moon, for clarity, change

- “eccentricity” to “orbital eccentricity”
- “semi-major axis” to “orbital semi-major axis”

(Thanks to Richard J. Mathar for these improvements.)

22 COORDINATE SYSTEMS – ASTRONOMICAL 9.10, page 702.

9/2024

The azimuth A is defined differently by different observation platforms. For clarity, replace

- A azimuth

with

- A azimuth (from true north, increasing eastward)

(Thanks to Richard J. Mathar for this improvement.)

23 COORDINATE SYSTEMS – TERRESTRIAL 9.11, page 703.

9/2024

Change the name of this section from
 COORDINATE SYSTEMS – TERRESTRIAL to
 COORDINATE SYSTEMS – PLANETARY

(Thanks to Richard J. Mathar for this improvement.)

24 QUANTUM MECHANICS 9.24, page 717.

9/2024

- The expression $E = n\hbar f$ is incorrect (note that this has an “h-bar”).
The expression should have been $E = nhf$.
- The expression $E = \hbar f$ is incorrect (note that this has an “h-bar”).
The expression should have been $E = hf$.

(Thanks to Robert Whiting and Richard J. Mathar for correcting these errors.)

25 STATISTICAL MECHANICS 9.29, page 720.

9/2024

Section 4 currently has

$$\rho(\mathbf{v}) = n_0 \left(\frac{m}{2\pi T} \right)^{3/2} e^{-m|\mathbf{v}|^2/2T}$$

which is incorrect. It should have been (there is a missing k_B)

$$\rho(\mathbf{v}) = n_0 \left(\frac{m}{2\pi T} \right)^{3/2} \exp\left(\frac{-m|\mathbf{v}|^2}{2k_B T} \right)$$

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

26 THERMODYNAMICS 9.30, page 724.

9/2024

- Section 4 currently has

$$\rho(\mathbf{v}) = n_0 \left(\frac{m}{2\pi T} \right)^{3/2} e^{-m|\mathbf{v}|^2/2T}$$

which is incorrect. It should have been (there is a missing k_B)

$$\rho(\mathbf{v}) = n_0 \left(\frac{m}{2\pi T} \right)^{3/2} \exp\left(\frac{-m|\mathbf{v}|^2}{2k_B T} \right)$$

- Change Stefan's constant to Stefan–Boltzmann constant
- Change Stefan's law to Stefan–Boltzmann law
- Plank's law is currently written as

$$\frac{2h\nu^3}{c^2} \frac{1}{e^{h\nu/kT} - 1}$$

which is incorrect. It should have been (the k should be k_B)

$$\frac{2h\nu^3}{c^2} \frac{1}{e^{h\nu/k_B T} - 1}$$

- The definition of k_B is missing. The following needs to be added to this section:
 - k_B Boltzmann's constant $\approx 1.38 \times 10^{-23} \frac{\text{J}}{\text{K}}$

(Thanks to Richard J. Mathar for correcting these errors.)

27 COMPUTER LANGUAGES 10.5, page 736.

9/2024

Remove the entry SciPy since this is package, not a language.

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

28 SI SYSTEM OF MEASUREMENT 10.23.1, page 795.

9/2024

- In table 3, the astronomical unit (au) is now shown with an approximate value

$$1 \text{ au} \approx 1.49598 \times 10^{11} \text{ m}$$

which is incorrect. It should have been the exact value

$$1 \text{ au} = 149,597,870.7 \text{ km}$$

- In table 4 the hectare is currently written as

$$1 \text{ ha} = 1 \text{ hm}^2 = 10^4 \text{ m}^2$$

which could be confusing. Replace this with

$$1 \text{ ha} = 10^4 \text{ m}^2$$

(Thanks to Richard J. Mathar for correcting these errors.)

29 PHYSICAL CONSTANTS 10.23.8, page 800.

9/2024

Avogadro's number is now shown with an approximate value

$$\text{Avogadro's number} \approx 6.022142 \times 10^{23}$$

which is incorrect. The exact value should have been given

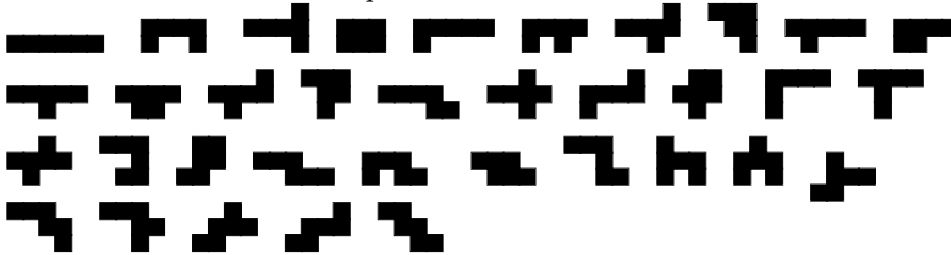
$$\text{Avogadro's number} = 6.02214076 \times 10^{23}$$

(Thanks to Richard J. Mathar for correcting these errors.)

Addendum to SMTF 33

Addendum to section 10.20.2 Polyominoes

For $N = 6$ the 35 distinct shapes are:



Addendum to section 10.24 Voting Power

Following are the Shapley–Shubik power index (ϕ) and the Banzhaf power index (β) for small games.

Game	ϕ	β
(3; 2, 1, 1, 1)	(3, 1, 1, 1)/6	(3, 1, 1, 1)/6
(3; 2, 1, 1)	(4, 1, 1)/6	(3, 1, 1)/5
(3; 2, 2, 1)	(1, 1, 1)/3	(1, 1, 1)/3

Game	ϕ	β
(4; 2, 1, 1, 1, 1)	(5, 2, 2, 2, 2, 2)/15	(5, 2, 2, 2, 2, 2)/15
(4; 2, 1, 1, 1, 1)	(8, 3, 3, 3, 3)/20	(5, 2, 2, 2, 2)/13
(4; 2, 1, 1, 1)	(3, 1, 1, 1)/6	(2, 1, 1, 1)/5
(4; 2, 1, 1)	(1, 1, 1)/3	(1, 1, 1)/3
(4; 2, 2, 1, 1, 1)	(9, 9, 4, 4, 4)/30	(2, 2, 1, 1, 1)/7
(4; 2, 2, 1, 1)	(2, 2, 1, 1)/6	(2, 2, 1, 1)/6
(4; 2, 2, 1)	(1, 1, 0)/2	(1, 1, 0)/2
(4; 2, 2, 2, 1)	(1, 1, 1, 0)/3	(1, 1, 1, 0)/3
(4; 2, 2, 2)	(1, 1, 1)/3	(1, 1, 1)/3
(4; 3, 1, 1, 1, 1)	(6, 1, 1, 1, 1)/10	(7, 1, 1, 1, 1)/11
(4; 3, 1, 1, 1)	(9, 1, 1, 1)/12	(7, 1, 1, 1)/10
(4; 3, 1, 1)	(4, 1, 1)/6	(3, 1, 1)/5
(4; 3, 2, 1, 1)	(3, 1, 1, 1)/6	(3, 1, 1, 1)/6
(4; 3, 2, 1)	(4, 1, 1)/6	(3, 1, 1)/5
(4; 3, 2, 2)	(1, 1, 1)/3	(1, 1, 1)/3
(4; 3, 3, 1)	(1, 1, 1)/3	(1, 1, 1)/3

Game	ϕ	β
(5; 2, 1, 1, 1, 1, 1)	(5, 2, 2, 2, 2, 2)/15	(15, 7, 7, 7, 7, 7)/50
(5; 2, 1, 1, 1, 1)	(8, 3, 3, 3, 3)/20	(5, 3, 3, 3, 3)/17
(5; 2, 1, 1, 1)	(1, 1, 1, 1)/4	(1, 1, 1, 1)/4
(5; 2, 2, 1, 1, 1, 1)	(16, 16, 7, 7, 7, 7)/60	(15, 15, 7, 7, 7, 7)/58
(5; 2, 2, 1, 1, 1)	(9, 9, 4, 4, 4)/30	(7, 7, 3, 3, 3)/23
(5; 2, 2, 1, 1)	(5, 5, 1, 1)/12	(3, 3, 1, 1)/8
(5; 2, 2, 1)	(1, 1, 1)/3	(1, 1, 1)/3
(5; 2, 2, 2, 1, 1, 1)	(7, 7, 7, 3, 3, 3)/30	(7, 7, 7, 3, 3, 3)/30
(5; 2, 2, 2, 1, 1)	(8, 8, 8, 3, 3)/30	(7, 7, 7, 3, 3)/27
(5; 2, 2, 2, 1)	(1, 1, 1, 1)/4	(1, 1, 1, 1)/4
(5; 2, 2, 2, 2, 1)	(1, 1, 1, 1, 1)/5	(1, 1, 1, 1, 1)/5
(5; 2, 2, 2, 2)	(1, 1, 1, 1)/4	(1, 1, 1, 1)/4
(5; 2, 2, 2)	(1, 1, 1)/3	(1, 1, 1)/3

Game	ϕ	β
(5; 3, 1, 1, 1, 1, 1)	(5, 1, 1, 1, 1, 1)/10	(5, 1, 1, 1, 1, 1)/10
(5; 3, 1, 1, 1, 1)	(6, 1, 1, 1, 1)/10	(11, 3, 3, 3, 3)/23
(5; 3, 1, 1, 1)	(3, 1, 1, 1)/6	(2, 1, 1, 1)/5
(5; 3, 1, 1)	(1, 1, 1)/3	(1, 1, 1)/3
(5; 3, 2, 1, 1, 1, 1)	(4, 2, 1, 1, 1, 1)/10	(11, 5, 3, 3, 3, 3)/28
(5; 3, 2, 1, 1, 1)	(27, 12, 7, 7, 7)/60	(11, 5, 3, 3, 3)/25
(5; 3, 2, 1, 1)	(7, 3, 1, 1)/12	(5, 3, 1, 1)/10
(5; 3, 2, 1)	(1, 1, 0)/2	(1, 1, 0)/2
(5; 3, 2, 2, 1, 1)	(12, 7, 7, 2, 2)/30	(5, 3, 3, 1, 1)/13
(5; 3, 2, 2, 1)	(5, 3, 3, 1)/12	(5, 3, 3, 1)/12
(5; 3, 2, 2, 2)	(3, 1, 1, 1)/6	(3, 1, 1, 1)/6
(5; 3, 2, 2)	(4, 1, 1)/6	(4, 1, 1)/6
(5; 3, 3, 1, 1, 1)	(9, 9, 4, 4, 4)/30	(2, 2, 1, 1, 1)/7
(5; 3, 3, 1, 1)	(2, 2, 1, 1)/6	(2, 2, 1, 1)/6
(5; 3, 3, 1)	(1, 1, 0)/2	(1, 1, 0)/2
(5; 3, 3, 2, 1)	(1, 1, 1, 0)/3	(1, 1, 1, 0)/3
(5; 3, 3, 2)	(1, 1, 1)/3	(1, 1, 1)/3
(5; 3, 3, 3)	(1, 1, 1)/3	(1, 1, 1)/3

Game	ϕ	β
(5; 4, 1, 1, 1, 1, 1, 1)	(10, 1, 1, 1, 1, 1, 1)/15	(15, 1, 1, 1, 1, 1, 1)/20
(5; 4, 1, 1, 1, 1, 1)	(16, 1, 1, 1, 1, 1)/20	(15, 1, 1, 1, 1, 1)/19
(5; 4, 1, 1, 1, 1)	(9, 1, 1, 1, 1)/12	(7, 1, 1, 1, 1)/10
(5; 4, 1, 1, 1)	(4, 1, 1)/6	(3, 1, 1)/5
(5; 4, 2, 1, 1, 1, 1)	(6, 1, 1, 1, 1, 1)/10	(7, 1, 1, 1, 1, 1)/11
(5; 4, 2, 1, 1, 1)	(9, 1, 1, 1, 1)/12	(7, 1, 1, 1, 1)/10
(5; 4, 2, 1)	(4, 1, 1)/6	(3, 1, 1)/5
(5; 4, 2, 2, 1)	(3, 1, 1, 1)/6	(3, 1, 1, 1)/6
(5; 4, 2, 2)	(4, 1, 1)/6	(3, 1, 1)/5
(5; 4, 3, 1, 1)	(3, 1, 1, 1, 1)/6	(3, 1, 1, 1, 1)/6
(5; 4, 3, 1)	(4, 1, 1)/6	(3, 1, 1)/5
(5; 4, 3, 2)	(1, 1, 1)/3	(1, 1, 1)/3
(5; 4, 4, 1)	(1, 1, 1)/3	(1, 1, 1)/3