

Content L^AT_EX 2_ε

N. Setzer

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1 Commands

1.1 Constants

1.1.1

| Command | Inline | Display |
|---------------------------|-----------|-----------|
| <code>\I</code> | i | i |
| <code>\E</code> | e | e |
| <code>\PI</code> | π | π |
| <code>\GoldenRatio</code> | φ | φ |
| <code>\EulerGamma</code> | γ | γ |
| <code>\Catalan</code> | C | C |
| <code>\Glaisher</code> | Glaisher | Glaisher |
| <code>\Khinchin</code> | Khinchin | Khinchin |

1.1.2 Symbols

| | | |
|-----------------------------------|------------------|------------------|
| <code>\Infinity</code> | ∞ | ∞ |
| <code>\Indeterminant</code> | \imath | \imath |
| <code>\DirectedInfinity{z}</code> | $z\infty$ | $z\infty$ |
| <code>\DirInfnty{z}</code> | $z\infty$ | $z\infty$ |
| <code>\ComplexInfinity</code> | $\tilde{\infty}$ | $\tilde{\infty}$ |
| <code>\CInfnty</code> | $\tilde{\infty}$ | $\tilde{\infty}$ |

1.2

1.2.1 Exponential and Logarithmic Functions

| Command | Inline | Display |
|--|---------------|---------------|
| <code>\Exp{5x}</code> | $\exp(5x)$ | $\exp(5x)$ |
| <code>\Style{ExpParen=b}</code> | | |
| <code>\Exp{5x}</code> | $\exp[5x]$ | $\exp[5x]$ |
| <code>\Style{ExpParen=br}</code> | | |
| <code>\Exp{5x}</code> | $\exp\{5x\}$ | $\exp\{5x\}$ |
| <code>\Log{5}</code> | $\ln 5$ | $\ln 5$ |
| <code>\Log[10]{5}</code> | $\log 5$ | $\log 5$ |
| <code>\Log[4]{5}</code> | $\log_4 5$ | $\log_4 5$ |
| <code>\Style{LogBaseESymb=log}</code> | | |
| <code>\Log{5}</code> | $\log 5$ | $\log 5$ |
| <code>\Log[10]{5}</code> | $\log_{10} 5$ | $\log_{10} 5$ |
| <code>\Log[4]{5}</code> | $\log_4 5$ | $\log_4 5$ |
| <code>\Style{LogShowBase=always}</code> | | |
| <code>\Log{5}</code> | $\log_e 5$ | $\log_e 5$ |
| <code>\Log[10]{5}</code> | $\log_{10} 5$ | $\log_{10} 5$ |
| <code>\Log[4]{5}</code> | $\log_4 5$ | $\log_4 5$ |
| <code>\Style{LogShowBase=at will}</code> | | |
| <code>\Log{5}</code> | $\ln 5$ | $\ln 5$ |
| <code>\Log[10]{5}</code> | $\log 5$ | $\log 5$ |
| <code>\Log[4]{5}</code> | $\log_4 5$ | $\log_4 5$ |
| <code>\Style{LogParen=p}</code> | | |
| <code>\Log[4]{5}</code> | $\log_4(5)$ | $\log_4(5)$ |

1.2.2 Trigonometric Functions

| | | |
|----------------------|-----------|-----------|
| <code>\Sin{x}</code> | $\sin(x)$ | $\sin(x)$ |
| <code>\Cos{x}</code> | $\cos(x)$ | $\cos(x)$ |
| <code>\Tan{x}</code> | $\tan(x)$ | $\tan(x)$ |
| <code>\Csc{x}</code> | $\csc(x)$ | $\csc(x)$ |
| <code>\Sec{x}</code> | $\sec(x)$ | $\sec(x)$ |
| <code>\Cot{x}</code> | $\cot(x)$ | $\cot(x)$ |

1.2.3 Inverse Trigonometric Functions

`\Style{ArcTrig=inverse}` (default)

| | | |
|-------------------------|----------------|----------------|
| <code>\ArcSin{x}</code> | $\sin^{-1}(x)$ | $\sin^{-1}(x)$ |
| <code>\ArcCos{x}</code> | $\cos^{-1}(x)$ | $\cos^{-1}(x)$ |
| <code>\ArcTan{x}</code> | $\tan^{-1}(x)$ | $\tan^{-1}(x)$ |

`\Style{ArcTrig=arc}`

| | | |
|-------------------------|--------------|--------------|
| <code>\ArcSin{x}</code> | $\arcsin(x)$ | $\arcsin(x)$ |
| <code>\ArcCos{x}</code> | $\arccos(x)$ | $\arccos(x)$ |
| <code>\ArcTan{x}</code> | $\arctan(x)$ | $\arctan(x)$ |

| | | |
|-------------------------|----------------|----------------|
| <code>\ArcCsc{x}</code> | $\csc^{-1}(x)$ | $\csc^{-1}(x)$ |
| <code>\ArcSec{x}</code> | $\sec^{-1}(x)$ | $\sec^{-1}(x)$ |
| <code>\ArcCot{x}</code> | $\cot^{-1}(x)$ | $\cot^{-1}(x)$ |

1.2.4 Hyperbolic Functions

| | | |
|-----------------------|--------------------------|--------------------------|
| <code>\Sinh{x}</code> | $\sinh(x)$ | $\sinh(x)$ |
| <code>\Cosh{x}</code> | $\cosh(x)$ | $\cosh(x)$ |
| <code>\Tanh{x}</code> | $\tanh(x)$ | $\tanh(x)$ |
| <code>\Csch{x}</code> | $\operatorname{csch}(x)$ | $\operatorname{csch}(x)$ |
| <code>\Sech{x}</code> | $\operatorname{sech}(x)$ | $\operatorname{sech}(x)$ |
| <code>\Coth{x}</code> | $\operatorname{coth}(x)$ | $\operatorname{coth}(x)$ |

1.2.5 Inverse Hyperbolic Functions

| | | |
|--------------------------|-------------------------------|-------------------------------|
| <code>\ArcSinh{x}</code> | $\sinh^{-1}(x)$ | $\sinh^{-1}(x)$ |
| <code>\ArcCosh{x}</code> | $\cosh^{-1}(x)$ | $\cosh^{-1}(x)$ |
| <code>\ArcTanh{x}</code> | $\tanh^{-1}(x)$ | $\tanh^{-1}(x)$ |
| <code>\ArcCsch{x}</code> | $\operatorname{csch}^{-1}(x)$ | $\operatorname{csch}^{-1}(x)$ |
| <code>\ArcSech{x}</code> | $\operatorname{sech}^{-1}(x)$ | $\operatorname{sech}^{-1}(x)$ |
| <code>\ArcCoth{x}</code> | $\operatorname{coth}^{-1}(x)$ | $\operatorname{coth}^{-1}(x)$ |

1.2.6 Product Logarithms

| Command | Inline | Display |
|-------------------------------|----------|----------|
| <code>\LambertW{z}</code> | $W(z)$ | $W(z)$ |
| <code>\ProductLog{z}</code> | $W(z)$ | $W(z)$ |
| <code>\LambertW{k,z}</code> | $W_k(z)$ | $W_k(z)$ |
| <code>\ProductLog{k,z}</code> | $W_k(z)$ | $W_k(z)$ |

1.2.7 Max and Min

| | | |
|------------------------------|-----------------------|-----------------------|
| <code>\Max{1,2,3,4,5}</code> | $\max(1, 2, 3, 4, 5)$ | $\max(1, 2, 3, 4, 5)$ |
| <code>\Min{1,2,3,4,5}</code> | $\min(1, 2, 3, 4, 5)$ | $\min(1, 2, 3, 4, 5)$ |

1.3 Bessel, Airy, and Struve Functions

1.3.1 Bessel

Bessel functions can be ‘renamed’ with the `\Style` tag. For example, `\Style{BesselYSymb=N}` yields $N_\nu(x)$

| Command | Inline | Display |
|-----------------------------|----------|----------|
| <code>\BesselJ{0}{x}</code> | $J_0(x)$ | $J_0(x)$ |
| <code>\BesselY{0}{x}</code> | $Y_0(x)$ | $Y_0(x)$ |
| <code>\BesselI{0}{x}</code> | $I_0(x)$ | $I_0(x)$ |
| <code>\BesselK{0}{x}</code> | $K_0(x)$ | $K_0(x)$ |

1.3.2 Airy

| | | |
|-------------------------|----------------|----------------|
| <code>\AiryAi{x}</code> | $\text{Ai}(x)$ | $\text{Ai}(x)$ |
| <code>\AiryBi{x}</code> | $\text{Bi}(x)$ | $\text{Bi}(x)$ |

1.3.3 Struve

| | | |
|-------------------------------|---------------------|---------------------|
| <code>\StruveH{\nu}{x}</code> | $\mathbf{H}_\nu(x)$ | $\mathbf{H}_\nu(x)$ |
| <code>\StruveL{\nu}{x}</code> | $\mathbf{L}_\nu(x)$ | $\mathbf{L}_\nu(x)$ |

1.4 Integer Functions

| Command | Inline | Display |
|--------------------------|---------------------|---------------------|
| <code>\Floor{x}</code> | $\lfloor x \rfloor$ | $\lfloor x \rfloor$ |
| <code>\Ceiling{x}</code> | $\lceil x \rceil$ | $\lceil x \rceil$ |
| <code>\Round{x}</code> | $\lfloor x \rfloor$ | $\lfloor x \rfloor$ |

1.4.1

| | | |
|---------------------------------|------------------|------------------|
| <code>\iPart{x}</code> | $\text{int}(x)$ | $\text{int}(x)$ |
| <code>\IntegerPart{x}</code> | $\text{int}(x)$ | $\text{int}(x)$ |
| <code>\fPart{x}</code> | $\text{frac}(x)$ | $\text{frac}(x)$ |
| <code>\FractionalPart{x}</code> | $\text{frac}(x)$ | $\text{frac}(x)$ |

1.4.2

| | | |
|---|-------------------------|-------------------------|
| <code>\Style{ModDisplay=mod}</code> (default) | | |
| <code>\Mod{m}{n}</code> | $m \bmod n$ | $m \bmod n$ |
| <code>\Style{ModDisplay=bmod}</code> | | |
| <code>\Mod{m}{n}</code> | $m \bmod n$ | $m \bmod n$ |
| <code>\Style{ModDisplay=pmod}</code> | | |
| <code>\Mod{m}{n}</code> | $m \pmod n$ | $m \pmod n$ |
| <code>\Style{ModDisplay=pod}</code> | | |
| <code>\Mod{m}{n}</code> | $m \ (n)$ | $m \ (n)$ |
| <code>\Quotient{m}{n}</code> | $\text{quotient}(m, n)$ | $\text{quotient}(m, n)$ |
| <code>\GCD{m, n}</code> | $\text{gcd}(m, n)$ | $\text{gcd}(m, n)$ |
| <code>\ExtendedGCD{m}{n}</code> | $\text{egcd}(m, n)$ | $\text{egcd}(m, n)$ |
| <code>\EGCD{m}{n}</code> | $\text{egcd}(m, n)$ | $\text{egcd}(m, n)$ |
| <code>\LCM{m, n}</code> | $\text{lcm}(m, n)$ | $\text{lcm}(m, n)$ |

1.4.3

| | | |
|----------------------------------|-----------------------|-----------------------|
| <code>\Fibonacci{\nu}</code> | F_ν | F_ν |
| <code>\Euler{m}</code> | E_m | E_m |
| <code>\Bernoulli{m}</code> | B_m | B_m |
| <code>\StirlingSOne{n}{m}</code> | $S_n^{(m)}$ | $S_n^{(m)}$ |
| <code>\StirlingSTwo{n}{m}</code> | $\mathcal{S}_n^{(m)}$ | $\mathcal{S}_n^{(m)}$ |
| <code>\PartitionsP{n}</code> | $p(n)$ | $p(n)$ |
| <code>\PartitionsQ{n}</code> | $q(n)$ | $q(n)$ |

1.4.4

| | | |
|---|------------------|------------------|
| <code>\DiscreteDelta{n, m}</code> | $\delta(n, m)$ | $\delta(n, m)$ |
| <code>\KroneckerDelta{n m}</code> | δ^{nm} | δ^{nm} |
| <code>\KroneckerDelta[d]{n m}</code> | δ_{nm} | δ_{nm} |
| <code>\LeviCivita{i j k}</code> | ϵ^{ijk} | ϵ^{ijk} |
| <code>\LeviCivita[d]{i j k}</code> | ϵ_{ijk} | ϵ_{ijk} |
| <code>\Signature{i j k}</code> | ϵ^{ijk} | ϵ^{ijk} |
| <code>\Style{LeviCivitaIndicies=up}</code> | | |
| <code>\LeviCivita[d]{i j k}</code> | ϵ^{ijk} | ϵ^{ijk} |
| <code>\Style{LeviCivitaIndicies=local}</code> | | |
| <code>\LeviCivita[d]{i j k}</code> | ϵ_{ijk} | ϵ_{ijk} |

1.5 Polynomials

Polynomials can be ‘renamed’ with the `\Style` command:

`\Style{ <Polynomial command> \Symb=<Symbol> }`

As in `\Style{HermiteHSymb=h, LegendrePSymb=p}` `\HermiteH{n}{x}` `\LegendreP{n,x}` yielding: $h_n(x)$ $p_n(x)$

| Command | Inline | Display |
|--|-----------------------|-----------------------|
| <code>\HermiteH{n}{x}</code> | $H_n(x)$ | $H_n(x)$ |
| <code>\LaguerreL{n,x}</code> | $L_n(x)$ | $L_n(x)$ |
| <code>\LegendreP{n,x}</code> | $P_n(x)$ | $P_n(x)$ |
| <code>\ChebyshevT{n}{x}</code> | $T_n(x)$ | $T_n(x)$ |
| <code>\ChebyshevU{n}{x}</code> | $U_n(x)$ | $U_n(x)$ |
| <code>\JacobiP{n}{a}{b}{x}</code> | $P_n^{(a,b)}(x)$ | $P_n^{(a,b)}(x)$ |
| <code>\AssocLegendreP{\ell}{m}{x}</code> | $P_\ell^m(x)$ | $P_\ell^m(x)$ |
| <code>\AssocLegendreQ{\ell}{m}{x}</code> | $Q_\ell^m(x)$ | $Q_\ell^m(x)$ |
| <code>\LaguerreL{n,\lambda,x}</code> | $L_n^\lambda(x)$ | $L_n^\lambda(x)$ |
| <code>\GegenbauerC{n}{\lambda}{x}</code> | $C_n^\lambda(x)$ | $C_n^\lambda(x)$ |
| <code>\SphericalHarmY{n}{m}{\theta}{\phi}</code> | $Y_n^m(\theta, \phi)$ | $Y_n^m(\theta, \phi)$ |
| <code>\CyclotomicC{n}{x}</code> | $C_n(x)$ | $C_n(x)$ |
| <code>\FibonacciF{n}{x}</code> | $F_n(x)$ | $F_n(x)$ |
| <code>\EulerE{n}{x}</code> | $E_n(x)$ | $E_n(x)$ |
| <code>\BernoulliB{n}{x}</code> | $B_n(x)$ | $B_n(x)$ |

1.6 Gamma, Beta, and Error Functions

1.6.1 Factorials

| Command | Inline | Display |
|--|---|--------------------|
| <code>\Factorial{n}</code> | $n!$ | $n!$ |
| <code>\DblFactorial{n}</code> | $n!!$ | $n!!$ |
| <code>\Binomial{n}{k}</code> | $\binom{n}{k}$ | $\binom{n}{k}$ |
| <code>\Multinomial{1,2,3,4}</code> | $(10; 1, 2, 3, 4)$ | $(10; 1, 2, 3, 4)$ |
| <code>\Multinomial{n_1, n_2, \ldots, n_m}</code> | | |
| Inline: | $(n_1 + n_2 + \dots + n_m; n_1, n_2, \dots, n_m)$ | |
| Display: | $(n_1 + n_2 + \dots + n_m; n_1, n_2, \dots, n_m)$ | |

1.6.2 Gamma Functions

| | | |
|--|-------------------|-------------------|
| <code>\GammaFunc{x}</code> | $\Gamma(x)$ | $\Gamma(x)$ |
| <code>\IncGamma{a}{x}</code> | $\Gamma(a, x)$ | $\Gamma(a, x)$ |
| <code>\GenIncGamma{a}{x}{y}</code> | $\Gamma(a, x, y)$ | $\Gamma(a, x, y)$ |
| <code>\RegIncGamma{a}{x}</code> | $Q(a, x)$ | $Q(a, x)$ |
| <code>\RegIncGammaInv{a}{x}</code> | $Q^{-1}(a, x)$ | $Q^{-1}(a, x)$ |
| <code>\GenRegIncGamma{a}{x}{y}</code> | $Q(a, x, y)$ | $Q(a, x, y)$ |
| <code>\GenRegIncGammaInv{a}{x}{y}</code> | $Q^{-1}(a, x, y)$ | $Q^{-1}(a, x, y)$ |
| <code>\Pochhammer{a}{n}</code> | $(a)_n$ | $(a)_n$ |
| <code>\LogGamma{x}</code> | $\log\Gamma(x)$ | $\log\Gamma(x)$ |

1.6.3 Derivatives of Gamma Functions

| | | |
|--|-----------------------|-----------------------|
| <code>\DiGamma{x}</code> | $F(x)$ | $F(x)$ |
| <code>\PolyGamma{\nu}{x}</code> | $\psi^{(\nu)}(x)$ | $\psi^{(\nu)}(x)$ |
| <code>\HarmNum{x}</code> | H_x | H_x |
| <code>\HarmNum{x,r}</code> | $H_x^{(r)}$ | $H_x^{(r)}$ |
| <code>\Beta{a,b}</code> | $B(a,b)$ | $B(a,b)$ |
| <code>\IncBeta{z}{a}{b}</code> | $B_z(a,b)$ | $B_z(a,b)$ |
| <code>\GenIncBeta{x}{y}{a}{b}</code> | $B_{(x,y)}(a,b)$ | $B_{(x,y)}(a,b)$ |
| <code>\RegIncBeta{z}{a}{b}</code> | $I_z(a,b)$ | $I_z(a,b)$ |
| <code>\RegIncBetaInv{z}{a}{b}</code> | $I_z^{-1}(a,b)$ | $I_z^{-1}(a,b)$ |
| <code>\GenRegIncBeta{x}{y}{a}{b}</code> | $B_{(x,y)}(a,b)$ | $B_{(x,y)}(a,b)$ |
| <code>\GenRegIncBetaInv{x}{y}{a}{b}</code> | $I_{(x,y)}^{-1}(a,b)$ | $I_{(x,y)}^{-1}(a,b)$ |

1.6.4 Error Functions

| | | |
|-------------------------------|--------------------------------|--------------------------------|
| <code>\Erf{x}</code> | $\operatorname{erf}(x)$ | $\operatorname{erf}(x)$ |
| <code>\InvErf{x}</code> | $\operatorname{erf}^{-1}(x)$ | $\operatorname{erf}^{-1}(x)$ |
| <code>\GenErf{x}y</code> | $\operatorname{erf}(x,y)$ | $\operatorname{erf}(x,y)$ |
| <code>\GenErfInv{x}{y}</code> | $\operatorname{erf}^{-1}(x,y)$ | $\operatorname{erf}^{-1}(x,y)$ |
| <code>\Erfc{x}</code> | $\operatorname{erfc}(x)$ | $\operatorname{erfc}(x)$ |
| <code>\ErfcInv{x}</code> | $\operatorname{erfc}^{-1}(x)$ | $\operatorname{erfc}^{-1}(x)$ |
| <code>\Erfi{x}</code> | $\operatorname{erfi}(x)$ | $\operatorname{erfi}(x)$ |

1.6.5 Fresnel Integrals

| | | |
|---------------------------|--------|--------|
| <code>\FresnelS{x}</code> | $S(x)$ | $S(x)$ |
| <code>\FresnelC{x}</code> | $C(x)$ | $C(x)$ |

1.6.6 Exponential Integrals

| | | |
|-------------------------------|-------------------------|-------------------------|
| <code>\ExpIntE{\nu}{x}</code> | $E_\nu(x)$ | $E_\nu(x)$ |
| <code>\ExpIntEi{x}</code> | $\operatorname{Ei}(x)$ | $\operatorname{Ei}(x)$ |
| <code>\LogInt{x}</code> | $\operatorname{li}(x)$ | $\operatorname{li}(x)$ |
| <code>\SinInt{x}</code> | $\operatorname{Si}(x)$ | $\operatorname{Si}(x)$ |
| <code>\CosInt{x}</code> | $\operatorname{Ci}(x)$ | $\operatorname{Ci}(x)$ |
| <code>\SinhInt{x}</code> | $\operatorname{Shi}(x)$ | $\operatorname{Shi}(x)$ |
| <code>\CoshInt{x}</code> | $\operatorname{Chi}(x)$ | $\operatorname{Chi}(x)$ |

1.7 Hypergeometric Functions

1.7.1 Hypergeometric Function

$$\backslash\mathrm{Hypergeometric}\{0\}\{0\}\{\}\{\}\{x\}$$
$${}_0F_0(; ; x) \quad {}_0F_0(; ; x)$$

$$\backslash\mathrm{Hypergeometric}\{0\}\{1\}\{\}\{b\}\{x\}$$
$${}_0F_1(; b; x) \quad {}_0F_1(; b; x)$$

$$\backslash\mathrm{Hypergeometric}\{1\}\{1\}\{a\}\{b\}\{x\}$$
$${}_1F_1(a; b; x) \quad {}_1F_1(a; b; x)$$

$$\backslash\mathrm{Hypergeometric}\{1\}\{1\}\{1\}\{1\}\{x\}$$
$${}_1F_1(1; 1; x) \quad {}_1F_1(1; 1; x)$$

$$\backslash\mathrm{Hypergeometric}\{3\}\{5\}\{a\}\{b\}\{x\}$$
$${}_3F_5(a_1, a_2, a_3; b_1, b_2, b_3, b_4, b_5; x) \quad {}_3F_5(a_1, a_2, a_3; b_1, b_2, b_3, b_4, b_5; x)$$

$$\backslash\mathrm{Hypergeometric}\{3\}\{5\}\{1, 2, 3\}\{1, 2, 3, 4, 5\}\{x\}$$
$${}_3F_5(1, 2, 3; 1, 2, 3, 4, 5; x) \quad {}_3F_5(1, 2, 3; 1, 2, 3, 4, 5; x)$$

$$\backslash\mathrm{Hypergeometric}\{p\}\{5\}\{a\}\{b\}\{x\}$$
$${}_pF_5(a_1, \dots, a_p; b_1, b_2, b_3, b_4, b_5; x) \quad {}_pF_5(a_1, \dots, a_p; b_1, b_2, b_3, b_4, b_5; x)$$

$$\backslash\mathrm{Hypergeometric}\{p\}\{3\}\{a\}\{1, 2, 3\}\{x\}$$
$${}_pF_3(a_1, \dots, a_p; 1, 2, 3; x) \quad {}_pF_3(a_1, \dots, a_p; 1, 2, 3; x)$$

$$\backslash\mathrm{Hypergeometric}\{p\}\{q\}\{a\}\{b\}\{x\}$$
$${}_pF_q(a_1, \dots, a_p; b_1, \dots, b_q; x) \quad {}_pF_q(a_1, \dots, a_p; b_1, \dots, b_q; x)$$

1.7.2 Regularized Hypergeometric Function

$$\backslash\mathrm{RegHypergeometric}\{0\}\{0\}\{\}\{\mathbf{x}\}$$

$${}_0\tilde{F}_0(;;x) \quad {}_0\tilde{F}_0(;;x)$$

$$\backslash\mathrm{RegHypergeometric}\{0\}\{1\}\{\}\{\mathbf{b}\}\{\mathbf{x}\}$$

$${}_0\tilde{F}_1(;b;x) \quad {}_0\tilde{F}_1(;b;x)$$

$$\backslash\mathrm{RegHypergeometric}\{3\}\{5\}\{\mathbf{a}\}\{\mathbf{b}\}\{\mathbf{x}\}$$

$${}_3\tilde{F}_5(a_1, a_2, a_3; b_1, b_2, b_3, b_4, b_5; x) \quad {}_3\tilde{F}_5(a_1, a_2, a_3; b_1, b_2, b_3, b_4, b_5; x)$$

$$\backslash\mathrm{RegHypergeometric}\{3\}\{5\}\{1,2,3\}\{1,2,3,4,5\}\{\mathbf{x}\}$$

$${}_3\tilde{F}_5(1, 2, 3; 1, 2, 3, 4, 5; x) \quad {}_3\tilde{F}_5(1, 2, 3; 1, 2, 3, 4, 5; x)$$

$$\backslash\mathrm{RegHypergeometric}\{p\}\{5\}\{\mathbf{a}\}\{\mathbf{b}\}\{\mathbf{x}\}$$

$${}_p\tilde{F}_5(a_1, \dots, a_p; b_1, b_2, b_3, b_4, b_5; x) \quad {}_p\tilde{F}_5(a_1, \dots, a_p; b_1, b_2, b_3, b_4, b_5; x)$$

$$\backslash\mathrm{RegHypergeometric}\{p\}\{3\}\{\mathbf{a}\}\{1,2,3\}\{\mathbf{x}\}$$

$${}_p\tilde{F}_3(a_1, \dots, a_p; 1, 2, 3; x) \quad {}_p\tilde{F}_3(a_1, \dots, a_p; 1, 2, 3; x)$$

$$\backslash\mathrm{RegHypergeometric}\{p\}\{q\}\{\mathbf{a}\}\{\mathbf{b}\}\{\mathbf{x}\}$$

$${}_p\tilde{F}_q(a_1, \dots, a_p; b_1, \dots, b_q; x) \quad {}_p\tilde{F}_q(a_1, \dots, a_p; b_1, \dots, b_q; x)$$

1.7.3 Meijer G-Function

$$\backslash\mathrm{MeijerG}[\mathbf{a},\mathbf{b}]\{\mathbf{n}\}\{\mathbf{p}\}\{\mathbf{m}\}\{\mathbf{q}\}\{\mathbf{x}\}$$

$$G_{p,q}^{m,n}\left(x \left| \begin{matrix} a_1, \dots, a_n, a_{n+1}, \dots, a_p \\ b_1, \dots, b_m, b_{m+1}, \dots, b_q \end{matrix} \right. \right) \quad G_{p,q}^{m,n}\left(x \left| \begin{matrix} a_1, \dots, a_n, a_{n+1}, \dots, a_p \\ b_1, \dots, b_m, b_{m+1}, \dots, b_q \end{matrix} \right. \right)$$

$$\backslash \text{MeijerG}\{1,2,3,4\}\{5,6\}\{3,6,9\}\{12,15,18,21,24\}\{x\}$$

$$G_{6,8}^{3,4}\left(x \left| \begin{array}{c} 1,2,3,4,5,6 \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right) \quad G_{6,8}^{3,4}\left(x \left| \begin{array}{c} 1,2,3,4,5,6 \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right)$$

$$\backslash \text{MeijerG}[a,b]\{4\}\{6\}\{3\}\{8\}\{x\}$$

$$G_{6,8}^{3,4}\left(x \left| \begin{array}{c} a_1,a_2,a_3,a_4,a_5,a_6 \\ b_1,b_2,b_3,b_4,b_5,b_6,b_7,b_8 \end{array} \right. \right) \quad G_{6,8}^{3,4}\left(x \left| \begin{array}{c} a_1,a_2,a_3,a_4,a_5,a_6 \\ b_1,b_2,b_3,b_4,b_5,b_6,b_7,b_8 \end{array} \right. \right)$$

$$\backslash \text{MeijerG}[a,b]\{4\}\{p\}\{3\}\{8\}\{x\}$$

$$G_{p,8}^{3,4}\left(x \left| \begin{array}{c} a_1,a_2,a_3,a_4,a_5,\dots,a_p \\ b_1,b_2,b_3,b_4,b_5,b_6,b_7,b_8 \end{array} \right. \right) \quad G_{p,8}^{3,4}\left(x \left| \begin{array}{c} a_1,a_2,a_3,a_4,a_5,\dots,a_p \\ b_1,b_2,b_3,b_4,b_5,b_6,b_7,b_8 \end{array} \right. \right)$$

$$\backslash \text{MeijerG}[a,b]\{n\}\{p\}\{3\}\{8\}\{x\}$$

$$G_{p,8}^{3,n}\left(x \left| \begin{array}{c} a_1,\dots,a_n,a_{n+1},\dots,a_p \\ b_1,b_2,b_3,b_4,b_5,b_6,b_7,b_8 \end{array} \right. \right) \quad G_{p,8}^{3,n}\left(x \left| \begin{array}{c} a_1,\dots,a_n,a_{n+1},\dots,a_p \\ b_1,b_2,b_3,b_4,b_5,b_6,b_7,b_8 \end{array} \right. \right)$$

$$\backslash \text{MeijerG}[a]\{4\}\{6\}\{3,6,9\}\{12,15,18,21,24\}\{x\}$$

$$G_{6,8}^{3,4}\left(x \left| \begin{array}{c} a_1,a_2,a_3,a_4,a_5,a_6 \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right) \quad G_{6,8}^{3,4}\left(x \left| \begin{array}{c} a_1,a_2,a_3,a_4,a_5,a_6 \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right)$$

$$\backslash \text{MeijerG}[a]\{4\}\{p\}\{3,6,9\}\{12,15,18,21,24\}\{x\}$$

$$G_{p,8}^{3,4}\left(x \left| \begin{array}{c} a_1,a_2,a_3,a_4,a_5,\dots,a_p \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right) \quad G_{p,8}^{3,4}\left(x \left| \begin{array}{c} a_1,a_2,a_3,a_4,a_5,\dots,a_p \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right)$$

$$\backslash \text{MeijerG}[a]\{n\}\{6\}\{3,6,9\}\{12,15,18,21,24\}\{x\}$$

$$G_{6,8}^{3,n}\left(x \left| \begin{array}{c} a_1,\dots,a_n,a_{n+1},\dots,a_6 \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right) \quad G_{6,8}^{3,n}\left(x \left| \begin{array}{c} a_1,\dots,a_n,a_{n+1},\dots,a_6 \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right)$$

$$\backslash \text{MeijerG}[a]\{n\}\{p\}\{3,6,9\}\{12,15,18,21,24\}\{x\}$$

$$G_{p,8}^{3,n}\left(x \left| \begin{array}{c} a_1,\dots,a_n,a_{n+1},\dots,a_p \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right) \quad G_{p,8}^{3,n}\left(x \left| \begin{array}{c} a_1,\dots,a_n,a_{n+1},\dots,a_p \\ 3,6,9,12,15,18,21,24 \end{array} \right. \right)$$

$$\backslash\mathrm{MeijerG}[,b]\{1,2,3,4\}\{5,6\}\{3\}\{8\}\{x\}$$

$$G_{6,8}^{3,4}\left(x\left|\begin{array}{c}1,2,3,4,5,6\\b_1,b_2,b_3,b_4,b_5,b_6,b_7,b_8\end{array}\right.\right) \quad G_{6,8}^{3,4}\left(x\left|\begin{array}{c}1,2,3,4,5,6\\b_1,b_2,b_3,b_4,b_5,b_6,b_7,b_8\end{array}\right.\right)$$

$$\backslash\mathrm{MeijerG}[,b]\{1,2,3,4\}\{5,6\}\{3\}\{q\}\{x\}$$

$$G_{6,q}^{3,4}\left(x\left|\begin{array}{c}1,2,3,4,5,6\\b_1,b_2,b_3,b_4,\dots,b_q\end{array}\right.\right) \quad G_{6,q}^{3,4}\left(x\left|\begin{array}{c}1,2,3,4,5,6\\b_1,b_2,b_3,b_4,\dots,b_q\end{array}\right.\right)$$

$$\backslash\mathrm{MeijerG}[,b]\{1,2,3,4\}\{5,6\}\{m\}\{q\}\{x\}$$

$$G_{6,q}^{m,4}\left(x\left|\begin{array}{c}1,2,3,4,5,6\\b_1,\dots,b_m,b_{m+1},\dots,b_q\end{array}\right.\right) \quad G_{6,q}^{m,4}\left(x\left|\begin{array}{c}1,2,3,4,5,6\\b_1,\dots,b_m,b_{m+1},\dots,b_q\end{array}\right.\right)$$

$$\backslash\mathrm{MeijerG}[a,b]\{n\}\{p\}\{m\}\{q\}\{x, \ r\}$$

$$G_{p,q}^{m,n}\left(x, r\left|\begin{array}{c}a_1,\dots,a_n,a_{n+1},\dots,a_p\\b_1,\dots,b_m,b_{m+1},\dots,b_q\end{array}\right.\right) \quad G_{p,q}^{m,n}\left(x, r\left|\begin{array}{c}a_1,\dots,a_n,a_{n+1},\dots,a_p\\b_1,\dots,b_m,b_{m+1},\dots,b_q\end{array}\right.\right)$$

1.7.4 Appell Hypergeometric Function F_1

$$\backslash\mathrm{AppellF0ne}\{a\}\{b_1, \ b_2\}\{c\}\{x, \ y\}$$

$$F_1(a; b_1, b_2; c; x, y) \quad F_1(a; b_1, b_2; c; x, y)$$

1.7.5 Tricomi Confluent Hypergeometric Function

| Command | Inline | Display |
|---|--------------|--------------|
| $\backslash\mathrm{HypergeometricU}\{a\}\{b\}\{x\}$ | $U(a, b, x)$ | $U(a, b, x)$ |

1.7.6 Angular Momentum Functions

$$\backslash\mathrm{ClebschGordon}\{j_1,m_1\}\{j_2,m_2\}\{j,m\}$$

$$\langle j_1, j_2; m_1, m_2 | j_1, j_2; j, m \rangle \quad \langle j_1, j_2; m_1, m_2 | j_1, j_2; j, m \rangle$$

$$\backslash\mathrm{SixJSymbol}\{j_1,j_2,j_3\}\{j_4,j_5,j_6\}$$

$$\left\{ \begin{array}{ccc} j_1 & j_2 & j_3 \\ j_4 & j_5 & j_6 \end{array} \right\} \quad \left\{ \begin{array}{ccc} j_1 & j_2 & j_3 \\ j_4 & j_5 & j_6 \end{array} \right\}$$

$$\backslash\mathrm{ThreeJSymbol}\{j_1,m_1\}\{j_2,m_2\}\{j_3,m_3\}$$

$$\left(\begin{array}{ccc} j_1 & j_2 & j_3 \\ m_1 & m_2 & m_3 \end{array} \right) \quad \left(\begin{array}{ccc} j_1 & j_2 & j_3 \\ m_1 & m_2 & m_3 \end{array} \right)$$

1.8 Elliptic Integrals

1.8.1 Complete Elliptic Integrals

| Command | Inline | Display |
|-------------------------------|------------|------------|
| <code>\EllipticK{x}</code> | $K(x)$ | $K(x)$ |
| <code>\EllipticE{x}</code> | $E(x)$ | $E(x)$ |
| <code>\EllipticPi{n,m}</code> | $\Pi(n m)$ | $\Pi(n m)$ |

1.8.2 Incomplete Elliptic Integrals

| Command | Inline | Display |
|--------------------------------------|---------------|---------------|
| <code>\IncEllipticF{x}{m}</code> | $F(x m)$ | $F(x m)$ |
| <code>\IncEllipticE{x}{m}</code> | $E(x m)$ | $E(x m)$ |
| <code>\IncEllipticPi{n}{x}{m}</code> | $\Pi(n; x m)$ | $\Pi(n; x m)$ |
| <code>\JacobiZeta{x}{m}</code> | $Z(x m)$ | $Z(x m)$ |

1.9 Elliptic Functions

1.9.1 Jacobi Theta Functions

| Command | Inline | Display |
|--------------------------------------|---------------------|---------------------|
| <code>\EllipticTheta{1}{x}{q}</code> | $\vartheta_1(x, q)$ | $\vartheta_1(x, q)$ |
| <code>\JacobiTheta{1}{x}{q}</code> | $\vartheta_1(x, q)$ | $\vartheta_1(x, q)$ |

1.9.2 Neville Theta Functions

| Command | Inline | Display |
|-----------------------------------|--------------------|--------------------|
| <code>\NevilleThetaC{x}{m}</code> | $\vartheta_c(x m)$ | $\vartheta_c(x m)$ |
| <code>\NevilleThetaD{x}{m}</code> | $\vartheta_d(x m)$ | $\vartheta_d(x m)$ |
| <code>\NevilleThetaN{x}{m}</code> | $\vartheta_n(x m)$ | $\vartheta_n(x m)$ |
| <code>\NevilleThetaS{x}{m}</code> | $\vartheta_s(x m)$ | $\vartheta_s(x m)$ |

1.9.3 Weierstrass Functions

$$\backslash\text{WeierstrassP}\{z\}\{g_2,g_3\}$$

$$\wp(z;g_2,g_3) \quad \wp(z;g_2,g_3)$$

$$\backslash\text{WeierstrassPInv}\{z\}\{g_2,g_3\}$$

$$\wp^{-1}(z;g_2,g_3) \quad \wp^{-1}(z;g_2,g_3)$$

$$\backslash\text{WeierstrassPGenInv}\{z_1\}\{z_2\}\{g_2\}\{g_3\}$$

$$\wp^{-1}(z_1,z_2;g_2,g_3) \quad \wp^{-1}(z_1,z_2;g_2,g_3)$$

$$\backslash\text{WeierstrassSigma}\{z\}\{g_2,g_3\}$$

$$\sigma(z;g_2,g_3) \quad \sigma(z;g_2,g_3)$$

$$\backslash\text{AssocWeierstrassSigma}\{n\}\{z\}\{g_2\}\{g_3\}$$

$$\backslash\text{WeiSigma}\{n,z\}\{g_2,g_3\}$$

$$\sigma_n(z;g_2,g_3) \quad \sigma_n(z;g_2,g_3)$$

$$\backslash\text{WeierstrassZeta}\{z\}\{g_2,g_3\}$$

$$\zeta(z;g_2,g_3) \quad \zeta(z;g_2,g_3)$$

$$\backslash\text{WeierstrassHalfPeriods}\{g_2,g_3\}$$

$$\{\omega_1(g_2,g_3),\omega_3(g_2,g_3)\} \quad \{\omega_1(g_2,g_3),\omega_3(g_2,g_3)\}$$

$$\backslash\text{WeierstrassInvariants}\{\omega_1,\omega_3\}$$

$$\{g_2(\omega_1,\omega_3),g_3(\omega_1,\omega_3)\} \quad \{g_2(\omega_1,\omega_3),g_3(\omega_1,\omega_3)\}$$

$$\backslash\text{Style}\{\text{WeierstrassPHalfPeriodValuesDisplay=sf}\} \text{ (Default)}$$

$$\backslash\text{WeierstrassPHalfPeriodValues}\{g_2,g_3\}$$

$$\{e_1,e_2,e_3\} \quad \{e_1,e_2,e_3\}$$

$$\backslash\text{Style}\{\text{WeierstrassPHalfPeriodValuesDisplay=ff}\}$$

$$\backslash\text{WeierstrassPHalfPeriodValues}\{g_2,g_3\}$$

$$\{e_1(g_2,g_3),e_2(g_2,g_3),e_3(g_2,g_3)\} \quad \{e_1(g_2,g_3),e_2(g_2,g_3),e_3(g_2,g_3)\}$$

`\Style{WeierstrassZetaHalfPeriodValuesDisplay=sf}` (Default)
`\WeierstrassZetaHalfPeriodValues{g_2,g_3}`
 $\{\eta_1, \eta_2, \eta_3\} \quad \{\eta_1, \eta_2, \eta_3\}$

`\Style{WeierstrassZetaHalfPeriodValuesDisplay=ff}`
`\WeierstrassZetaHalfPeriodValues{g_2,g_3}`
 $\{\eta_1(g_2, g_3), \eta_2(g_2, g_3), \eta_3(g_2, g_3)\} \quad \{\eta_1(g_2, g_3), \eta_2(g_2, g_3), \eta_3(g_2, g_3)\}$

1.9.4 Jacobi Functions

| Command | Inline | Display |
|-------------------------------------|-------------------------------|-------------------------------|
| <code>\JacobiAmplitude{z}{m}</code> | $\operatorname{am}(z m)$ | $\operatorname{am}(z m)$ |
| <code>\JacobiCD{z}{m}</code> | $\operatorname{cd}(z m)$ | $\operatorname{cd}(z m)$ |
| <code>\JacobiCDInv{z}{m}</code> | $\operatorname{cd}^{-1}(z m)$ | $\operatorname{cd}^{-1}(z m)$ |
| <code>\JacobiCN{z}{m}</code> | $\operatorname{cn}(z m)$ | $\operatorname{cn}(z m)$ |
| <code>\JacobiCNInv{z}{m}</code> | $\operatorname{cn}^{-1}(z m)$ | $\operatorname{cn}^{-1}(z m)$ |
| <code>\JacobiCS{z}{m}</code> | $\operatorname{cs}(z m)$ | $\operatorname{cs}(z m)$ |
| <code>\JacobiCSInv{z}{m}</code> | $\operatorname{cs}^{-1}(z m)$ | $\operatorname{cs}^{-1}(z m)$ |
| <code>\JacobiDC{z}{m}</code> | $\operatorname{dc}(z m)$ | $\operatorname{dc}(z m)$ |
| <code>\JacobiDCInv{z}{m}</code> | $\operatorname{dc}^{-1}(z m)$ | $\operatorname{dc}^{-1}(z m)$ |
| <code>\JacobiDN{z}{m}</code> | $\operatorname{dn}(z m)$ | $\operatorname{dn}(z m)$ |
| <code>\JacobiDNInv{z}{m}</code> | $\operatorname{dn}^{-1}(z m)$ | $\operatorname{dn}^{-1}(z m)$ |
| <code>\JacobiDS{z}{m}</code> | $\operatorname{ds}(z m)$ | $\operatorname{ds}(z m)$ |
| <code>\JacobiDSInv{z}{m}</code> | $\operatorname{ds}^{-1}(z m)$ | $\operatorname{ds}^{-1}(z m)$ |
| <code>\JacobiNC{z}{m}</code> | $\operatorname{nc}(z m)$ | $\operatorname{nc}(z m)$ |
| <code>\JacobiNCInv{z}{m}</code> | $\operatorname{nc}^{-1}(z m)$ | $\operatorname{nc}^{-1}(z m)$ |
| <code>\JacobiND{z}{m}</code> | $\operatorname{nd}(z m)$ | $\operatorname{nd}(z m)$ |
| <code>\JacobiNDInv{z}{m}</code> | $\operatorname{nd}^{-1}(z m)$ | $\operatorname{nd}^{-1}(z m)$ |
| <code>\JacobiNS{z}{m}</code> | $\operatorname{ns}(z m)$ | $\operatorname{ns}(z m)$ |
| <code>\JacobiNSInv{z}{m}</code> | $\operatorname{ns}^{-1}(z m)$ | $\operatorname{ns}^{-1}(z m)$ |
| <code>\JacobiSC{z}{m}</code> | $\operatorname{sc}(z m)$ | $\operatorname{sc}(z m)$ |
| <code>\JacobiSCInv{z}{m}</code> | $\operatorname{sc}^{-1}(z m)$ | $\operatorname{sc}^{-1}(z m)$ |
| <code>\JacobiSD{z}{m}</code> | $\operatorname{sd}(z m)$ | $\operatorname{sd}(z m)$ |
| <code>\JacobiSDInv{z}{m}</code> | $\operatorname{sd}^{-1}(z m)$ | $\operatorname{sd}^{-1}(z m)$ |
| <code>\JacobiSN{z}{m}</code> | $\operatorname{sn}(z m)$ | $\operatorname{sn}(z m)$ |
| <code>\JacobiSNInv{z}{m}</code> | $\operatorname{sn}^{-1}(z m)$ | $\operatorname{sn}^{-1}(z m)$ |

1.9.5 Modular Functions

| Command | Inline | Display |
|-----------------------------------|--------------|--------------|
| <code>\DedekindEta{z}</code> | $\eta(z)$ | $\eta(z)$ |
| <code>\KleinInvariantJ{z}</code> | $J(z)$ | $J(z)$ |
| <code>\ModularLambda{z}</code> | $\lambda(z)$ | $\lambda(z)$ |
| <code>\EllipticNomeQ{z}</code> | $q(z)$ | $q(z)$ |
| <code>\EllipticNomeQInv{z}</code> | $q^{-1}(z)$ | $q^{-1}(z)$ |

1.9.6 Arithmetic Geometric Mean

| Command | Inline | Display |
|----------------------------------|----------------------------|----------------------------|
| <code>\ArithGeoMean{a}{b}</code> | $\operatorname{agm}(a, b)$ | $\operatorname{agm}(a, b)$ |

1.9.7 Elliptic Exp and Log

| Command | Inline | Display |
|-------------------------------------|-----------------------------------|-----------------------------------|
| <code>\EllipticExp{x}{a,b}</code> | $\operatorname{eexp}(x; a, b)$ | $\operatorname{eexp}(x; a, b)$ |
| <code>\EllipticLog{x,y}{a,b}</code> | $\operatorname{elog}(x, y; a, b)$ | $\operatorname{elog}(x, y; a, b)$ |

1.10 Zeta Functions and Polylogarithms

1.10.1 Zeta Functions

| Command | Inline | Display |
|---|--------------------|--------------------|
| <code>\RiemannZeta{s}</code> | $\zeta(s)$ | $\zeta(s)$ |
| <code>\Zeta{s}</code> | $\zeta(s)$ | $\zeta(s)$ |
| <code>\HurwitzZeta{s}{a}</code> | $\zeta(s, a)$ | $\zeta(s, a)$ |
| <code>\Zeta{s, a}</code> | $\zeta(s, a)$ | $\zeta(s, a)$ |
| <code>\RiemannSiegelTheta{x}</code> | $\vartheta(x)$ | $\vartheta(x)$ |
| <code>\RiemannSiegelZ{x}</code> | $Z(x)$ | $Z(x)$ |
| <code>\StieltjesGamma{n}</code> | γ_n | γ_n |
| <code>\LerchPhi{z}{s}{a}</code> | $\Phi(z, s, a)$ | $\Phi(z, s, a)$ |
| <code>\NielsenPolyLog{\nu}{p}{z}</code> | $S_\nu^p(z)$ | $S_\nu^p(z)$ |
| <code>\PolyLog{\nu, p, z}</code> | $S_\nu^p(z)$ | $S_\nu^p(z)$ |
| <code>\PolyLog{\nu, z}</code> | $\text{Li}_\nu(z)$ | $\text{Li}_\nu(z)$ |
| <code>\DiLog{z}</code> | $\text{Li}_2(z)$ | $\text{Li}_2(z)$ |

1.11 Mathieu Functions and Characteristics

1.11.1 Mathieu Functions

| Command | Inline | Display |
|---------------------------------|----------------------|----------------------|
| <code>\MathieuC{a}{q}{z}</code> | $\text{Ce}(a, q, z)$ | $\text{Ce}(a, q, z)$ |
| <code>\MathieuS{a}{q}{z}</code> | $\text{Se}(a, q, z)$ | $\text{Se}(a, q, z)$ |

1.11.2 Mathieu Characteristics

| Command | Inline | Display |
|---|-----------|-----------|
| <code>\MathieuCharacteristicA{r}{q}</code> | $a_r(q)$ | $a_r(q)$ |
| <code>\MathieuCharisticA{r}{q}</code> | $a_r(q)$ | $a_r(q)$ |
| <code>\MathieuCharacteristicB{r}{q}</code> | $b_r(q)$ | $b_r(q)$ |
| <code>\MathieuCharisticB{r}{q}</code> | $b_r(q)$ | $b_r(q)$ |
| <code>\MathieuCharacteristicExponent{a}{q}</code> | $r(a, q)$ | $r(a, q)$ |
| <code>\MathieuCharisticExp{a}{q}</code> | $r(a, q)$ | $r(a, q)$ |

1.12 Complex Components

| Command | Inline | Display |
|---|-------------------------|-------------------------|
| <code>\Abs{z}</code> | $ z $ | $ z $ |
| <code>\Arg{z}</code> | $\arg(z)$ | $\arg(z)$ |
| <code>\Conj{z}</code> | z^* | z^* |
| <code>\Style{Conjugate=bar}\Conj{z}</code> | \bar{z} | \bar{z} |
| <code>\Style{Conjugate=overline}\Conj{z}</code> | \bar{z} | \bar{z} |
| <code>\Real{z}</code> | $\operatorname{Re} z$ | $\operatorname{Re} z$ |
| <code>\Imag{z}</code> | $\operatorname{Im} z$ | $\operatorname{Im} z$ |
| <code>\Sign{z}</code> | $\operatorname{sgn}(z)$ | $\operatorname{sgn}(z)$ |

1.13 Number Theory Functions

| Command | Inline | Display |
|-----------------------------------|------------------------------|------------------------------|
| <code>\FactorInteger{n}</code> | $\operatorname{factors}(n)$ | $\operatorname{factors}(n)$ |
| <code>\Factors{n}</code> | $\operatorname{factors}(n)$ | $\operatorname{factors}(n)$ |
| <code>\Divisors{n}</code> | $\operatorname{divisors}(n)$ | $\operatorname{divisors}(n)$ |
| <code>\Prime{n}</code> | $\operatorname{prime}(n)$ | $\operatorname{prime}(n)$ |
| <code>\PrimePi{x}</code> | $\pi(x)$ | $\pi(x)$ |
| <code>\DivisorSigma{k}{n}</code> | $\sigma_k(n)$ | $\sigma_k(n)$ |
| <code>\EulerPhi{n}</code> | $\varphi(n)$ | $\varphi(n)$ |
| <code>\MoebiusMu{n}</code> | $\mu(n)$ | $\mu(n)$ |
| <code>\JacobiSymbol{n}{m}</code> | $\left(\frac{n}{m}\right)$ | $\left(\frac{n}{m}\right)$ |
| <code>\CarmichaelLambda{n}</code> | $\lambda(n)$ | $\lambda(n)$ |

`\DigitCount{n}{b}`

Inline: $\{s_b^{(1)}(n), s_b^{(2)}(n), \dots, s_b^{(b)-1}(n), s_b^{(0)}(n)\}$

Display: $\{s_b^{(1)}(n), s_b^{(2)}(n), \dots, s_b^{(b)-1}(n), s_b^{(0)}(n)\}$

`\DigitCount{n}{6}`

Inline: $\{s_6^1(n), s_6^2(n), s_6^3(n), s_6^4(n), s_6^5(n), s_6^{(0)}(n)\}$

Display: $\{s_6^1(n), s_6^2(n), s_6^3(n), s_6^4(n), s_6^5(n), s_6^{(0)}(n)\}$

1.14 Generalized Functions

| Command | Inline | Display |
|------------------------------------|--------------------|--------------------|
| <code>\DiracDelta{x}</code> | $\delta(x)$ | $\delta(x)$ |
| <code>\DiracDelta{x_1, x_2}</code> | $\delta(x_1, x_2)$ | $\delta(x_1, x_2)$ |
| <code>\HeavisideStep{x}</code> | $\theta(x)$ | $\theta(x)$ |
| <code>\HeavisideStep{x, y}</code> | $\theta(x, y)$ | $\theta(x, y)$ |
| <code>\UnitStep{x}</code> | $\theta(x)$ | $\theta(x)$ |
| <code>\UnitStep{x, y}</code> | $\theta(x, y)$ | $\theta(x, y)$ |

1.15 Calculus Functions

1.15.1 Derivatives

`\Style{DDisplayFunc=inset,DShorten=true}` (Default)

`\D{f}{x}` $\frac{df}{dx}$ $\frac{df}{dx}$

`\D[n]{f}{x}` $\frac{d^n f}{dx^n}$ $\frac{d^n f}{dx^n}$

`\Style{DDisplayFunc=outset,DShorten=false}`

$$\backslash\mathrm{D}\{\mathrm{f}\}\{\mathrm{x}\} \qquad \frac{d}{dx}f \qquad \frac{d}{dx}f$$

$$\backslash\mathrm{D}[\mathrm{n}]\{\mathrm{f}\}\{\mathrm{x}\} \qquad \frac{d^n}{dx^n}f \qquad \frac{d^n}{dx^n}f$$

$$\backslash\mathrm{D}\{\mathrm{f}\}\{\mathrm{x},\mathrm{y},\mathrm{z}\} \qquad \frac{d}{dx}\frac{d}{dy}\frac{d}{dz}f \qquad \frac{d}{dx}\frac{d}{dy}\frac{d}{dz}f$$

$$\backslash\mathrm{D}[2,\mathrm{n},3]\{\mathrm{f}\}\{\mathrm{x},\mathrm{y},\mathrm{z}\} \qquad \frac{d^2}{dx^2}\frac{d^n}{dy^n}\frac{d^3}{dz^3}f \qquad \frac{d^2}{dx^2}\frac{d^n}{dy^n}\frac{d^3}{dz^3}f$$

$$\backslash\mathrm{D}[1,\mathrm{n},3]\{\mathrm{f}\}\{\mathrm{x},\mathrm{y},\mathrm{z}\} \qquad \frac{d}{dx}\frac{d^n}{dy^n}\frac{d^3}{dz^3}f \qquad \frac{d}{dx}\frac{d^n}{dy^n}\frac{d^3}{dz^3}f$$

`\Style{DDisplayFunc=outset,DShorten=true}`

$$\backslash\mathrm{D}\{\mathrm{f}\}\{\mathrm{x}\} \qquad \frac{d}{dx}f \qquad \frac{d}{dx}f$$

$$\backslash\mathrm{D}[\mathrm{n}]\{\mathrm{f}\}\{\mathrm{x}\} \qquad \frac{d^n}{dx^n}f \qquad \frac{d^n}{dx^n}f$$

$$\backslash\mathrm{D}\{\mathrm{f}\}\{\mathrm{x},\mathrm{y},\mathrm{z}\} \qquad \frac{d^3}{dx\,dy\,dz}f \qquad \frac{d^3}{dx\,dy\,dz}f$$

$$\backslash\mathrm{D}[2,\mathrm{n},3]\{\mathrm{f}\}\{\mathrm{x},\mathrm{y},\mathrm{z}\} \qquad \frac{d^{2+n+3}}{dx^2\,dy^n\,dz^3}f \qquad \frac{d^{2+n+3}}{dx^2\,dy^n\,dz^3}f$$

$$\backslash\mathrm{D}[1,\mathrm{n},3]\{\mathrm{f}\}\{\mathrm{x},\mathrm{y},\mathrm{z}\} \qquad \frac{d^{1+n+3}}{dx\,dy^n\,dz^3}f \qquad \frac{d^{1+n+3}}{dx\,dy^n\,dz^3}f$$

`\Style{DDisplayFunc=inset,DShorten=true}`

$$\backslash\mathrm{D}\{f\}\{x\} \qquad \frac{df}{dx} \qquad \frac{df}{dx}$$

$$\backslash\mathrm{D}[n]\{f\}\{x\} \qquad \frac{d^n f}{dx^n} \qquad \frac{d^n f}{dx^n}$$

$$\backslash\mathrm{D}\{f\}\{x,y,z\} \qquad \frac{d^3 f}{dx\,dy\,dz} \qquad \frac{d^3 f}{dx\,dy\,dz}$$

$$\backslash\mathrm{D}[2,n,3]\{f\}\{x,y,z\} \qquad \frac{d^{2+n+3} f}{dx^2\,dy^n\,dz^3} \qquad \frac{d^{2+n+3} f}{dx^2\,dy^n\,dz^3}$$

$$\backslash\mathrm{D}[1,n,3]\{f\}\{x,y,z\} \qquad \frac{d^{1+n+3} f}{dx\,dy^n\,dz^3} \qquad \frac{d^{1+n+3} f}{dx\,dy^n\,dz^3}$$

1.15.2 Partial Derivatives

`\Style{DDisplayFunc=inset,DShorten=true}` (Default)

$$\backslash\mathrm{pderiv}\{f\}\{x\} \qquad \frac{\partial f}{\partial x} \qquad \frac{\partial f}{\partial x}$$

$$\backslash\mathrm{pderiv}[n]\{f\}\{x\} \qquad \frac{\partial^n f}{\partial x^n} \qquad \frac{\partial^n f}{\partial x^n}$$

`\Style{DDisplayFunc=outset,DShorten=false}`

| | | |
|---------------------------------------|---|---|
| <code>\pderiv{f}{x}</code> | $\frac{\partial}{\partial x} f$ | $\frac{\partial}{\partial x} f$ |
| <code>\pderiv[n]{f}{x}</code> | $\frac{\partial^n}{\partial x^n} f$ | $\frac{\partial^n}{\partial x^n} f$ |
| <code>\pderiv{f}{x,y,z}</code> | $\frac{\partial}{\partial x} \frac{\partial}{\partial y} \frac{\partial}{\partial z} f$ | $\frac{\partial}{\partial x} \frac{\partial}{\partial y} \frac{\partial}{\partial z} f$ |
| <code>\pderiv[2,n,3]{f}{x,y,z}</code> | $\frac{\partial^2}{\partial x^2} \frac{\partial^n}{\partial y^n} \frac{\partial^3}{\partial z^3} f$ | $\frac{\partial^2}{\partial x^2} \frac{\partial^n}{\partial y^n} \frac{\partial^3}{\partial z^3} f$ |
| <code>\pderiv[1,n,3]{f}{x,y,z}</code> | $\frac{\partial}{\partial x} \frac{\partial^n}{\partial y^n} \frac{\partial^3}{\partial z^3} f$ | $\frac{\partial}{\partial x} \frac{\partial^n}{\partial y^n} \frac{\partial^3}{\partial z^3} f$ |

`\Style{DDisplayFunc=outset,DShorten=true}`

| | | |
|---------------------------------------|---|---|
| <code>\pderiv{f}{x}</code> | $\frac{\partial}{\partial x} f$ | $\frac{\partial}{\partial x} f$ |
| <code>\pderiv[n]{f}{x}</code> | $\frac{\partial^n}{\partial x^n} f$ | $\frac{\partial^n}{\partial x^n} f$ |
| <code>\pderiv{f}{x,y,z}</code> | $\frac{\partial^3}{\partial x \partial y \partial z} f$ | $\frac{\partial^3}{\partial x \partial y \partial z} f$ |
| <code>\pderiv[2,n,3]{f}{x,y,z}</code> | $\frac{\partial^{2+n+3}}{\partial x^2 \partial y^n \partial z^3} f$ | $\frac{\partial^{2+n+3}}{\partial x^2 \partial y^n \partial z^3} f$ |
| <code>\pderiv[1,n,3]{f}{x,y,z}</code> | $\frac{\partial^{1+n+3}}{\partial x \partial y^n \partial z^3} f$ | $\frac{\partial^{1+n+3}}{\partial x \partial y^n \partial z^3} f$ |

`\Style{DDisplayFunc=inset,DShorten=true}`

| | | |
|---------------------------------------|---|---|
| <code>\pderiv{f}{x}</code> | $\frac{\partial f}{\partial x}$ | $\frac{\partial f}{\partial x}$ |
| <code>\pderiv[n]{f}{x}</code> | $\frac{\partial^n f}{\partial x^n}$ | $\frac{\partial^n f}{\partial x^n}$ |
| <code>\pderiv{f}{x,y,z}</code> | $\frac{\partial^3 f}{\partial x \partial y \partial z}$ | $\frac{\partial^3 f}{\partial x \partial y \partial z}$ |
| <code>\pderiv[2,n,3]{f}{x,y,z}</code> | $\frac{\partial^{2+n+3} f}{\partial x^2 \partial y^n \partial z^3}$ | $\frac{\partial^{2+n+3} f}{\partial x^2 \partial y^n \partial z^3}$ |
| <code>\pderiv[1,n,3]{f}{x,y,z}</code> | $\frac{\partial^{1+n+3} f}{\partial x \partial y^n \partial z^3}$ | $\frac{\partial^{1+n+3} f}{\partial x \partial y^n \partial z^3}$ |

1.15.3 Integrals

| Command | Inline | Display |
|---|--------------------------------------|--------------------------------------|
| <code>\Integrate{f}{x}</code> | $\int f \, dx$ | $\int f \, dx$ |
| <code>\Int{f(x)}{x}</code> | $\int f(x) \, dx$ | $\int f(x) \, dx$ |
| <code>\Int{f}{S,C}</code> | $\int_C f \, dS$ | $\int_C f \, dS$ |
| <code>\Int{f(x)}{x,a,b}</code> | $\int_a^b f(x) \, dx$ | $\int_a^b f(x) \, dx$ |
| <code>\Int{f(x)}{x,0,b}</code> | $\int_0^b f(x) \, dx$ | $\int_0^b f(x) \, dx$ |
| <code>\Int{\Int{f(x)}{x,0,y}}{y,0,z}</code> | $\int_0^z \int_0^y f(x) \, dx \, dy$ | $\int_0^z \int_0^y f(x) \, dx \, dy$ |

1.15.4 Sums and Products

| Command | Inline | Display |
|---------------------------------|----------------------|----------------------|
| <code>\Sum{a(k)}{k}</code> | $\sum_k a(k)$ | $\sum_k a(k)$ |
| <code>\Sum{a(k)}{k,1,n}</code> | $\sum_{k=1}^n a(k)$ | $\sum_{k=1}^n a(k)$ |
| <code>\Prod{a(k)}{k}</code> | $\prod_k a(k)$ | $\prod_k a(k)$ |
| <code>\Prod{a(k)}{k,1,n}</code> | $\prod_{k=1}^n a(k)$ | $\prod_{k=1}^n a(k)$ |

1.15.5 Matrices

| Command | Inline | Display |
|--|--|--|
| <code>\IdentityMatrix</code> | \mathbb{I} | \mathbb{I} |
| <code>\Style{IdentityMatrixParen=p}</code> (Default) | | |
| <code>\IdentityMatrix[2]</code> | $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ | $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ |
| <code>\Style{IdentityMatrixParen=b}</code> | | |
| <code>\IdentityMatrix[2]</code> | $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ | $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ |
| <code>\Style{IdentityMatrixParen=br}</code> | | |
| <code>\IdentityMatrix[2]</code> | $\begin{Bmatrix} 1 & 0 \\ 0 & 1 \end{Bmatrix}$ | $\begin{Bmatrix} 1 & 0 \\ 0 & 1 \end{Bmatrix}$ |
| <code>\Style{IdentityMatrixParen=none}</code> | | |
| <code>\IdentityMatrix[2]</code> | $\begin{matrix} 1 & 0 \\ 0 & 1 \end{matrix}$ | $\begin{matrix} 1 & 0 \\ 0 & 1 \end{matrix}$ |
| <code>\IdentityMatrix[20]</code> yields | | |

[illegible]

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