Hypergeometric0F0

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Notations

Traditional name

Generalized hypergeometric function ${}_0F_0$

Traditional notation

${}_0F_0(;;z)$

Mathematica StandardForm notation

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HypergeometricPFQ[{}, {}, z]
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Primary definition

07.16.02.0001.01

$${}_0F_0(;;z) = \sum_{k=0}^{\infty} \frac{z^k}{k!} = e^z$$

Limit representations

07.16.09.0001.01

$${}_0F_0(;;z) = \lim_{b\to\infty} {}_0F_1(;b;b\,z)$$

07.16.09.0002.01

$${}_0F_0(;;z) = \lim_{a\to\infty} {}_1F_0\left(a;;\frac{z}{a}\right)$$

Differential equations

Ordinary linear differential equations and wronskians

For the direct function itself

07.16.13.0001.01

$$w'(z) - w(z) = 0 \;/;\; w(z) = c_1\,{}_0F_0(;;z)$$

07.16.13.0002.01

$$w'(z) - w(z) = 0 \;/;\; w(z) = {}_0F_0(;;z) \bigwedge w[0] = 1$$

Differentiation

Low-order differentiation

07.16.20.0001.01

$$\frac{\partial\, {}_0F_0(;\,;z)}{\partial z} = e^z$$

07.16.20.0002.01

$$\frac{\partial^2\, {}_0F_0(;\,;z)}{\partial z^2} = e^z$$

Symbolic differentiation

07.16.20.0003.02

$$\frac{\partial^n\, {}_0F_0(;\,;z)}{\partial z^n} = e^z \;/;\; n \in \mathbb{N}$$

Fractional integro-differentiation

07.16.20.0004.01

$$\frac{\partial^\alpha\, {}_0F_0(;\,;z)}{\partial z^\alpha} = e^z\, Q(-\alpha, 0, z)$$

Integration

Indefinite integration

Involving only one direct function

07.16.21.0001.01

$$\int {}_0F_0(;\,;z)\, dz = e^z$$

Involving one direct function and elementary functions

Involving power function

07.16.21.0002.01

$$\int z^{\alpha-1}\, {}_0F_0(;\,;z)\, dz = -(-z)^{-\alpha} z^\alpha\, \Gamma(\alpha, -z)$$

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