Erfi

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Notations

Traditional name

Imaginary error function

Traditional notation

$\operatorname{erfi}(z)$

Mathematica StandardForm notation

`Erfi[z]`

Primary definition

06.28.02.0001.01

$$\operatorname{erfi}(z) = \frac{2}{\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{z^{2k+1}}{k!\,(2k+1)}$$

Specific values

Values at fixed points

06.28.03.0001.01

$$\operatorname{erfi}(0) = 0$$

Values at infinities

06.28.03.0002.01

$$\operatorname{erfi}(\infty) = \infty$$

06.28.03.0003.01

$$\operatorname{erfi}(-\infty) = -\infty$$

06.28.03.0004.01

$$\operatorname{erfi}(i\,\infty) = i$$

06.28.03.0005.01

$$\operatorname{erfi}(-i\,\infty) = -i$$

06.28.03.0006.01

$$\operatorname{erfi}(\tilde{\infty}) = ¿$$

General characteristics

Domain and analyticity

erfi(z) is an entire analytical function of z which is defined in the whole complex z-plane.

06.28.04.0001.01

$$z \longrightarrow \text{erfi}(z) :: \mathbb{C} \longrightarrow \mathbb{C}$$

Symmetries and periodicities

Parity

erfi(z) is an odd function.

06.28.04.0002.01

$$\text{erfi}(-z) = -\text{erfi}(z)$$

Mirror symmetry

06.28.04.0003.01

$$\text{erfi}(\bar{z}) = \overline{\text{erfi}(z)}$$

Periodicity

No periodicity

Poles and essential singularities

The function erfi(z) has only one singular point at $z = \tilde{\infty}$. It is an essential singular point.

06.28.04.0004.01

$$\mathcal{Sing}_z(\text{erfi}(z)) = \{\{\tilde{\infty}, \infty\}\}$$

Branch points

The function erfi(z) does not have branch points.

06.28.04.0005.01

$$\mathcal{BP}_z(\text{erfi}(z)) = \{\}$$

Branch cuts

The function erfi(z) does not have branch cuts.

06.28.04.0006.01

$$\mathcal{BC}_z(\text{erfi}(z)) = \{\}$$

Series representations

Generalized power series

Expansions at generic point $z = z_0$

For the function itself

06.28.06.0010.01

$$\operatorname{erfi}(z) \propto \operatorname{erfi}(z_0) + \frac{2\, e^{z_0^2}}{\sqrt{\pi}} (z - z_0) + \frac{2\, e^{z_0^2}\, z_0}{\sqrt{\pi}} (z - z_0)^2 + \ldots \;/;\; (z \to z_0)$$

06.28.06.0011.01

$$\operatorname{erfi}(z) \propto \operatorname{erfi}(z_0) + \frac{2\, e^{z_0^2}}{\sqrt{\pi}} (z - z_0) + \frac{2\, e^{z_0^2}\, z_0}{\sqrt{\pi}} (z - z_0)^2 + O\left((z - z_0)^3\right)$$

06.28.06.0012.01

$$\operatorname{erfi}(z) = \operatorname{erfi}(z_0) + \frac{2\, e^{z_0^2}}{\sqrt{\pi}} \sum_{k=1}^{\infty} \sum_{j=0}^{k-1} \frac{(2\, j - k + 2)_{2\,(k-j-1)}}{k!\, (k - j - 1)!\, (2\, z_0)^{k-2\, j-1}} (z - z_0)^k$$

06.28.06.0013.01

$$\operatorname{erfi}(z) = \sum_{k=0}^{\infty} \frac{2^k\, z_0^{1-k}}{k!}\, {}_2\tilde{F}_2\left(\frac{1}{2}, 1;\, 1 - \frac{k}{2}, \frac{3-k}{2};\, z_0^2\right) (z - z_0)^k$$

06.28.06.0014.01

$$\operatorname{erf} i(z) \propto \operatorname{erfi}(z_0)\, (1 + O(z - z_0))$$

Expansions at $z = 0$

For the function itself

06.28.06.0001.02

$$\operatorname{erfi}(z) \propto \frac{2}{\sqrt{\pi}} \left(z + \frac{z^3}{3} + \frac{z^5}{10} + \ldots\right) /;\; (z \to 0)$$

06.28.06.0015.01

$$\operatorname{erfi}(z) \propto \frac{2}{\sqrt{\pi}} \left(z + \frac{z^3}{3} + \frac{z^5}{10} + O\left(z^7\right)\right)$$

06.28.06.0002.01

$$\operatorname{erfi}(z) = \frac{2}{\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{z^{2\, k+1}}{k!\, (2\, k + 1)}$$

06.28.06.0003.01

$$\operatorname{erfi}(z) = \frac{2\, z}{\sqrt{\pi}}\, {}_1F_1\left(\frac{1}{2};\, \frac{3}{2};\, z^2\right)$$

06.28.06.0004.02

$$\operatorname{erfi}(z) \propto \frac{2\, z}{\sqrt{\pi}} \left(1 + O\left(z^2\right)\right)$$

06.28.06.0016.01

$$\operatorname{erfi}(z) = F_\infty(z) \;/;\; \left(\left(F_n(z) = \frac{2\, z}{\sqrt{\pi}} \sum_{k=0}^{n} \frac{z^{2\, k}}{(2\, k + 1)\, k!} = \operatorname{erfi}(z) - \frac{2\, z^{2\, n+3}}{\sqrt{\pi}\, (2\, n + 3)\, (n + 1)!}\, {}_2F_2\left(1, n + \frac{3}{2};\, n + 2, n + \frac{5}{2};\, z^2\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

Asymptotic series expansions

06.28.06.0005.01

$$\operatorname{erfi}(z) \propto \frac{z}{\sqrt{-z^2}} + \frac{1}{\sqrt{\pi}\, z} e^{z^2} {}_2F_0\left(1, \frac{1}{2};; \frac{1}{z^2}\right) /; (|z| \to \infty)$$

06.28.06.0006.02

$$\operatorname{erfi}(z) \propto \frac{z}{\sqrt{-z^2}} + \frac{1}{\sqrt{\pi}\, z} e^{z^2} \left(1 + O\left(\frac{1}{z^2}\right)\right) /; (|z| \to \infty)$$

06.28.06.0017.01

$$\operatorname{erfi}(z) \propto \begin{cases} -i + \frac{e^{z^2}}{\sqrt{\pi}\, z} & \arg(z) \leq 0 \\ i + \frac{e^{z^2}}{\sqrt{\pi}\, z} & \text{True} \end{cases} /; (|z| \to \infty)$$

Residue representations

06.28.06.0007.01

$$\operatorname{erfi}(z) = \frac{z}{\sqrt{\pi}} \sum_{j=0}^{\infty} \operatorname{res}_s \left(\frac{\Gamma\left(\frac{1}{2} - s\right) \left(-z^2\right)^{-s}}{\Gamma\left(\frac{3}{2} - s\right)} \Gamma(s) \right) (-j)$$

06.28.06.0008.01

$$\operatorname{erfi}(z) = -\frac{i}{\sqrt{\pi}} \sum_{j=0}^{\infty} \operatorname{res}_s \left(\frac{\Gamma(-s)\,(i\,z)^{-2s}}{\Gamma(1-s)} \Gamma\left(s + \frac{1}{2}\right) \right) \left(-\frac{1}{2} - j\right)$$

Other series representations

06.28.06.0009.01

$$\operatorname{erfi}(z) = \frac{i}{\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{(-1)^{k-1} H_{2k+1}(i\,z)}{2^{3k+\frac{1}{2}}\, k!\, (2k+1)}$$

Integral representations

On the real axis

Of the direct function

06.28.07.0001.01

$$\operatorname{erfi}(z) = \frac{2}{\sqrt{\pi}} \int_0^z e^{t^2}\, dt$$

06.28.07.0002.01

$$\operatorname{erfi}(x) = -\frac{1}{\pi} e^{x^2} \mathcal{P} \int_{-\infty}^{\infty} \frac{e^{-t^2}}{t - x}\, dt \,/;\, x \in \mathbb{R}$$

06.28.07.0003.01

$$\operatorname{erfi}(x) = \frac{2}{\sqrt{\pi}} e^{x^2} \int_0^\infty e^{-t^2} \sin(2\,x\,t)\, dt \,/;\, x \in \mathbb{R}$$

Contour integral representations

06.28.07.0004.01

$$\operatorname{erfi}(z) = \frac{z}{\sqrt{\pi}\; 2\,\pi\,i} \int_{\mathcal{L}} \frac{\Gamma(s)\,\Gamma\left(\frac{1}{2}-s\right)}{\Gamma\left(\frac{3}{2}-s\right)} \left(-z^2\right)^{-s} ds$$

06.28.07.0005.01

$$\operatorname{erfi}(z) = -\frac{1}{2\,\pi^{3/2}} \int_{\gamma-i\,\infty}^{\gamma+i\,\infty} \frac{\Gamma\left(s+\frac{1}{2}\right)\Gamma(-s)}{\Gamma(1-s)} (i\,z)^{-2\,s}\, ds \,/;\, -\frac{1}{2} < \gamma \bigwedge |\arg(i\,z)| < \frac{\pi}{2}$$

Continued fraction representations

Involving the function

06.28.10.0001.01

$$\operatorname{erfi}(z) = i + i\,\frac{e^{z^2}}{\sqrt{\pi}}\,\cfrac{1}{i\,z + \cfrac{1/2}{i\,z + \cfrac{1}{i\,z + \cfrac{3/2}{i\,z + \cfrac{2}{i\,z + \cfrac{5/2}{i\,z + \cfrac{3}{i\,z + \ldots}}}}}}} \,/;\, \operatorname{Im}(z) > 0$$

06.28.10.0002.01

$$\operatorname{erfi}(z) = i + \frac{i\,e^{z^2}}{\sqrt{\pi}\,\left(i\,z + \mathrm{K}_k\left(\frac{k}{2},\, i\,z\right)_1^\infty\right)} \,/;\, \operatorname{Im}(z) > 0$$

06.28.10.0003.01

$$\operatorname{erfi}(z) = \frac{2\,z}{\sqrt{\pi}}\,e^{z^2}\,\cfrac{1}{1 + \cfrac{2\,z^2}{3 - \cfrac{4\,z^2}{5 + \cfrac{6\,z^2}{7 - \cfrac{8\,z^2}{9 + \cfrac{10\,z^2}{11 - \cfrac{12\,z^2}{13 + \ldots}}}}}}}$$

06.28.10.0004.01

$$\operatorname{erfi}(z) = \frac{2\,z\,e^{z^2}}{\sqrt{\pi}\,\left(1 + \mathrm{K}_k\left((-1)^{k-1}\,2\,k\,z^2,\, 2\,k+1\right)_1^\infty\right)}$$

06.28.10.0005.01

$$\operatorname{erfi}(z) = \frac{2z}{\sqrt{\pi}} e^{z^2} \cfrac{1}{1+2z^2-\cfrac{4z^2}{3+2z^2-\cfrac{8z^2}{5+2z^2-\cfrac{12z^2}{7+2z^2-\cfrac{16z^2}{9+2z^2-\cfrac{20z^2}{11+2z^2-\cfrac{24z^2}{13+2z^2-\ldots}}}}}}}$$

06.28.10.0006.01

$$\operatorname{erfi}(z) = \frac{2z e^{z^2}}{\sqrt{\pi}\left(1+2z^2+\mathrm{K}_k\left(-4kz^2, 2z^2+2k+1\right)_1^\infty\right)}$$

06.28.10.0007.01

$$\operatorname{erfi}(z) = -i + \frac{2i}{\sqrt{\pi}} e^{z^2} \cfrac{1}{2iz+\cfrac{2}{2iz+\cfrac{4}{2iz+\cfrac{6}{2iz+\cfrac{8}{2iz+\cfrac{10}{2iz+\cfrac{12}{2iz+\ldots}}}}}}} \text{ /; } \operatorname{Im}(z) < 0$$

06.28.10.0008.01

$$\operatorname{erfi}(z) = -i + \frac{2i\, e^{z^2}}{\sqrt{\pi}\left(2iz+\mathrm{K}_k(2k, 2iz)_1^\infty\right)} \text{ /; } \operatorname{Im}(z) < 0$$

06.28.10.0009.01

$$\operatorname{erfi}(z) = -i + \frac{2iz}{\sqrt{\pi}} e^{z^2}\, 1 \Bigg/ \left(1-2z^2-\cfrac{2}{5-2z^2-\cfrac{12}{9-2z^2-\cfrac{30}{13-2z^2-\cfrac{56}{17-2z^2-\cfrac{90}{21-2z^2-\cfrac{132}{2\times 5-2z^2-\ldots}}}}}}\right) \text{ /; } \operatorname{Im}(z) < 0$$

06.28.10.0010.01

$$\text{erfi}(z) = -i + \frac{2\,i\,z\,e^{z^2}}{\sqrt{\pi}\left(1 - 2z^2 + \text{K}_k\left(-2k(2k-1),\, 4k + 1 - 2z^2\right)_1^\infty\right)} \;/;\; \text{Im}(z) < 0$$

Differential equations

Ordinary linear differential equations and wronskians

For the direct function itself

06.28.13.0001.01

$$w''(z) - 2\,z\,w'(z) = 0 \;/;\; w(z) = \text{erfi}(z) \bigwedge w(0) = 0 \bigwedge w'(0) = \frac{2}{\sqrt{\pi}}$$

06.28.13.0002.01

$$w''(z) - 2\,z\,w'(z) = 0 \;/;\; w(z) = c_1\,\text{erfi}(z) + c_2$$

06.28.13.0003.01

$$W_z(1,\, \text{erfi}(z)) = \frac{2\,e^{z^2}}{\sqrt{\pi}}$$

06.28.13.0004.01

$$w''(z) - \left(2\,g(z)\,g'(z) + \frac{g''(z)}{g'(z)}\right) w'(z) = 0 \;/;\; w(z) = c_1\,\text{erfi}(g(z)) + c_2$$

06.28.13.0005.01

$$W_z(\text{erfi}(g(z)),\, 1) = -\frac{2\,e^{g(z)^2}\,g'(z)}{\sqrt{\pi}}$$

06.28.13.0006.01

$$w''(z) - \left(2\,g(z)\,g'(z) + \frac{2\,h'(z)}{h(z)} + \frac{g''(z)}{g'(z)}\right) w'(z) + \left(\frac{2\,h'(z)^2}{h(z)^2} + \frac{2\,g(z)\,g'(z)\,h'(z)}{h(z)} + \frac{g''(z)\,h'(z)}{h(z)\,g'(z)} - \frac{h''(z)}{h(z)}\right) w(z) = 0 \;/;$$
$$w(z) = c_1\,h(z)\,\text{erfi}(g(z)) + c_2\,h(z)$$

06.28.13.0007.01

$$W_z(h(z)\,\text{erfi}(g(z)),\, h(z)) = -\frac{2\,e^{g(z)^2}\,h(z)^2\,g'(z)}{\sqrt{\pi}}$$

06.28.13.0008.01

$$z^2\,w''(z) - \left(2\,a^2\,r\,z^{2r} + r + 2\,s - 1\right) z\,w'(z) + s\left(2\,a^2\,r\,z^{2r} + r + s\right) w(z) = 0 \;/;\; w(z) = c_1\,z^s\,\text{erfi}(a\,z^r) + c_2\,z^s$$

06.28.13.0009.01

$$W_z(z^s\,\text{erfi}(a\,z^r),\, z^s) = -\frac{2\,a\,e^{a^2 z^{2r}}\,r\,z^{r+2s-1}}{\sqrt{\pi}}$$

06.28.13.0010.01

$$w''(z) - \left(2\,a^2\log(r)\,r^{2z} + \log(r) + 2\log(s)\right) w'(z) + \log(s)\left(2\,a^2\log(r)\,r^{2z} + \log(r) + \log(s)\right) w(z) = 0 \;/;\; w(z) = c_1\,s^z\,\text{erfi}(a\,r^z) + c_2\,s^z$$

06.28.13.0011.01

$$W_z(s^z\,\text{erfi}(a\,r^z),\, s^z) = -\frac{2\,a\,e^{a^2 r^{2z}}\,r^z\,s^{2z}\log(r)}{\sqrt{\pi}}$$

Transformations

Transformations and argument simplifications

Argument involving basic arithmetic operations

06.28.16.0001.01

$$\operatorname{erfi}(-z) = -\operatorname{erfi}(z)$$

06.28.16.0002.01

$$\operatorname{erfi}(i z) = i \operatorname{erf}(z)$$

06.28.16.0003.01

$$\operatorname{erfi}(-i z) = -i \operatorname{erf}(z)$$

06.28.16.0004.01

$$\operatorname{erfi}(a (b z^c)^m) = \frac{(b z^c)^m}{b^m z^{m c}} \operatorname{erfi}(a b^m z^{m c}) /; 2 m \in \mathbb{Z}$$

06.28.16.0005.01

$$\operatorname{erfi}\left(\sqrt{z^2}\right) = \frac{\sqrt{z^2}}{z} \operatorname{erfi}(z)$$

Complex characteristics

Real part

06.28.19.0001.01

$$\operatorname{Re}(\operatorname{erfi}(x + i y)) = \frac{2}{\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{x^{2k+1}}{(2k+1) k!} \, {}_1F_1\left(k + \frac{1}{2}; \frac{1}{2}; -y^2\right)$$

06.28.19.0002.01

$$\operatorname{Re}(\operatorname{erfi}(x + i y)) = \frac{2}{\sqrt{\pi}} e^{-y^2} \sum_{k=0}^{\infty} \frac{(-1)^k x^{2k+1}}{(2k+1)!} H_{2k}(y)$$

06.28.19.0003.01

$$\operatorname{Re}(\operatorname{erfi}(x + i y)) = \frac{1}{2} \left(\operatorname{erfi}\left(x + x \sqrt{-\frac{y^2}{x^2}} \right) + \operatorname{erfi}\left(x - x \sqrt{-\frac{y^2}{x^2}} \right) \right)$$

Imaginary part

06.28.19.0004.01

$$\operatorname{Im}(\operatorname{erfi}(x + i y)) = \frac{2 y}{\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{x^{2k}}{k!} \, {}_1F_1\left(k + \frac{1}{2}; \frac{3}{2}; -y^2\right)$$

06.28.19.0005.01

$$\operatorname{Im}(\operatorname{erfi}(x + i y)) = \operatorname{erf}(y) + \frac{2}{\sqrt{\pi}} e^{-y^2} \sum_{k=0}^{\infty} \frac{(-1)^k x^{2k+2}}{(2k+2)!} H_{2k+1}(y)$$

06.28.19.0006.01

$$\operatorname{Im}(\operatorname{erfi}(x+i\,y)) = \frac{x}{2\,y}\sqrt{-\frac{y^2}{x^2}}\left(\operatorname{erfi}\left(x-x\sqrt{-\frac{y^2}{x^2}}\right)-\operatorname{erfi}\left(x+x\sqrt{-\frac{y^2}{x^2}}\right)\right)$$

Absolute value

06.28.19.0007.01

$$|\operatorname{erfi}(x+i\,y)| = \sqrt{\operatorname{erfi}\left(x-x\sqrt{-\frac{y^2}{x^2}}\right)\operatorname{erfi}\left(x+x\sqrt{-\frac{y^2}{x^2}}\right)}$$

Argument

06.28.19.0008.01

$$\arg(\operatorname{erfi}(x+i\,y)) = \tan^{-1}\left(\frac{1}{2}\left(\operatorname{erfi}\left(x+x\sqrt{-\frac{y^2}{x^2}}\right)+\operatorname{erfi}\left(x-x\sqrt{-\frac{y^2}{x^2}}\right)\right), \frac{x}{2\,y}\sqrt{-\frac{y^2}{x^2}}\left(\operatorname{erfi}\left(x-x\sqrt{-\frac{y^2}{x^2}}\right)-\operatorname{erfi}\left(x+x\sqrt{-\frac{y^2}{x^2}}\right)\right)\right)$$

Conjugate value

06.28.19.0009.01

$$\overline{\operatorname{erfi}(x+i\,y)} = \frac{1}{2}\left(\operatorname{erfi}\left(x+x\sqrt{-\frac{y^2}{x^2}}\right)+\operatorname{erfi}\left(x-x\sqrt{-\frac{y^2}{x^2}}\right)\right)-\frac{i\,x}{2\,y}\sqrt{-\frac{y^2}{x^2}}\left(\operatorname{erfi}\left(x-x\sqrt{-\frac{y^2}{x^2}}\right)-\operatorname{erfi}\left(x+x\sqrt{-\frac{y^2}{x^2}}\right)\right)$$

Signum value

06.28.19.0010.01

$$\operatorname{sgn}(\operatorname{erfi}(x+i\,y)) = \left(\frac{i}{y}\sqrt{-\frac{y^2}{x^2}}\,x\left(\operatorname{erfi}\left(x-x\sqrt{-\frac{y^2}{x^2}}\right)-\operatorname{erfi}\left(\sqrt{-\frac{y^2}{x^2}}\,x+x\right)\right)+\operatorname{erfi}\left(\sqrt{-\frac{y^2}{x^2}}\,x+x\right)+\operatorname{erfi}\left(x-x\sqrt{-\frac{y^2}{x^2}}\right)\right) \Big/ \left(2\sqrt{\operatorname{erfi}\left(x-x\sqrt{-\frac{y^2}{x^2}}\right)\operatorname{erfi}\left(\sqrt{-\frac{y^2}{x^2}}\,x+x\right)}\right)$$

Differentiation

Low-order differentiation

06.28.20.0001.01

$$\frac{\partial \operatorname{erfi}(z)}{\partial z} = \frac{2\,e^{z^2}}{\sqrt{\pi}}$$

06.28.20.0002.01

$$\frac{\partial^2 \operatorname{erfi}(z)}{\partial z^2} == \frac{4 e^{z^2} z}{\sqrt{\pi}}$$

Symbolic differentiation

06.28.20.0006.01

$$\frac{\partial^n \operatorname{erfi}(z)}{\partial z^n} == \operatorname{erfi}(z)\, \delta_n + \frac{2}{\sqrt{\pi}} e^{z^2} \sum_{k=0}^{n-1} \frac{(2k-n+2)_{2(n-k-1)}}{(n-k-1)!\,(2z)^{n-2k-1}} \;/;\; n \in \mathbb{N}$$

06.28.20.0003.01

$$\frac{\partial^n \operatorname{erfi}(z)}{\partial z^n} == \operatorname{erfi}(z)\, \delta_n + \operatorname{Boole}\left(n \neq 0, \frac{2^{-n}(n-1)!}{\sqrt{\pi}} e^{z^2} \sum_{k=1}^{n} \frac{2^{2k} z^{2k-n-1}}{(2k-n-1)!\,(n-k)!}\right) /;\; n \in \mathbb{N}$$

06.28.20.0004.02

$$\frac{\partial^n \operatorname{erfi}(z)}{\partial z^n} == 2^n z^{1-n} {}_2\tilde{F}_2\left(\frac{1}{2}, 1; 1-\frac{n}{2}, \frac{3-n}{2}; z^2\right) /;\; n \in \mathbb{N}$$

Fractional integro-differentiation

06.28.20.0005.01

$$\frac{\partial^\alpha \operatorname{erfi}(z)}{\partial z^\alpha} == 2^\alpha z^{1-\alpha} {}_2\tilde{F}_2\left(\frac{1}{2}, 1; 1-\frac{\alpha}{2}, \frac{3-\alpha}{2}; z^2\right)$$

Integration

Indefinite integration

Involving only one direct function

06.28.21.0001.01

$$\int \operatorname{erfi}(b+az)\, dz == \frac{b \operatorname{erfi}(b+az)}{a} + z \operatorname{erfi}(b+az) - \frac{e^{b^2+2azb+a^2z^2}}{a\sqrt{\pi}}$$

06.28.21.0002.01

$$\int \operatorname{erfi}(az)\, dz == z \operatorname{erfi}(az) - \frac{e^{a^2 z^2}}{a\sqrt{\pi}}$$

06.28.21.0003.01

$$\int \operatorname{erfi}(z)\, dz == z \operatorname{erfi}(z) - \frac{e^{z^2}}{\sqrt{\pi}}$$

Involving one direct function and elementary functions

Involving power function

Involving power

Linear argument

06.28.21.0004.01

$$\int z^{\alpha-1}\operatorname{erfi}(a z)\,dz == \frac{a z^{\alpha+1}\left(-a^2 z^2\right)^{-\frac{\alpha+1}{2}}}{\sqrt{\pi}\,\alpha}\,\Gamma\left(\frac{\alpha+1}{2}, -a^2 z^2\right) + \frac{z^\alpha \operatorname{erfi}(a z)}{\alpha}$$

06.28.21.0005.01

$$\int z^{\alpha-1}\operatorname{erfi}(z)\,dz == \frac{z^{\alpha+1}\left(-z^2\right)^{-\frac{\alpha+1}{2}}}{\sqrt{\pi}\,\alpha}\,\Gamma\left(\frac{\alpha+1}{2}, -z^2\right) + \frac{z^\alpha \operatorname{erfi}(z)}{\alpha}$$

06.28.21.0006.01

$$\int z\operatorname{erfi}(a z)\,dz == \frac{1}{2}\operatorname{erfi}(a z)\,z^2 - \frac{e^{a^2 z^2} z}{2 a\sqrt{\pi}} + \frac{\operatorname{erfi}(a z)}{4 a^2}$$

06.28.21.0007.01

$$\int \frac{\operatorname{erfi}(a z)}{z}\,dz == \frac{2 a z}{\sqrt{\pi}}\,{}_2F_2\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}, \frac{3}{2}; a^2 z^2\right)$$

06.28.21.0008.01

$$\int \frac{\operatorname{erfi}(a z)}{z^2}\,dz == \frac{a\operatorname{Ei}\left(a^2 z^2\right)}{\sqrt{\pi}} - \frac{\operatorname{erfi}(a z)}{z}$$

Power arguments

06.28.21.0009.01

$$\int z^{\alpha-1}\operatorname{erfi}(a z^r)\,dz == \frac{a z^{r+\alpha}\left(-a^2 z^{2r}\right)^{-\frac{r+\alpha}{2r}}}{\sqrt{\pi}\,\alpha}\,\Gamma\left(\frac{r+\alpha}{2r}, -a^2 z^{2r}\right) + \frac{z^\alpha \operatorname{erfi}(a z^r)}{\alpha}$$

Involving rational functions

06.28.21.0010.01

$$\int \frac{\left(z^2-b\right)\operatorname{erfi}(a z)}{\left(z^2+b\right)^2}\,dz == \frac{a\,e^{-a^2 b}\operatorname{Ei}\left(z^2 a^2 + b a^2\right)}{\sqrt{\pi}} - \frac{z\operatorname{erfi}(a z)}{z^2+b}$$

Involving exponential function

Involving exp

06.28.21.0011.01

$$\int e^{b z}\operatorname{erfi}(a z)\,dz == \frac{e^{b z}\operatorname{erfi}(a z)}{b} - \frac{1}{b}\exp\left(-\frac{b^2}{4 a^2}\right)\operatorname{erfi}\left(\frac{2 z a^2 + b}{2 a}\right)$$

06.28.21.0012.01

$$\int e^{b z^2}\operatorname{erfi}(a z)\,dz == \frac{1}{\sqrt{\pi}\,b}\sum_{k=0}^{\infty}\frac{(-1)^k b^{-k} a^{2k+1}\,\Gamma\left(k+1, -b z^2\right)}{(2k+1)\,k!}$$

06.28.21.0013.01

$$\int e^{b z^2} \operatorname{erfi}(a z) \, dz = \frac{\sqrt{\pi} \operatorname{erfi}(a z) \operatorname{erfi}\left(\sqrt{b} z\right)}{2\sqrt{b}} - \frac{1}{a\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{(-1)^k b^k a^{-2k} \Gamma\left(k+1, -a^2 z^2\right)}{(2k+1) k!}$$

06.28.21.0014.01

$$\int e^{a^2 z^2} \operatorname{erfi}(a z) \, dz = \frac{\sqrt{\pi} \operatorname{erfi}(a z)^2}{4a}$$

Involving exponential function and a power function

Involving exp and power

06.28.21.0015.01

$$\int z^{\alpha-1} e^{b z} \operatorname{erfi}(a z) \, dz = \frac{2 a z^{\alpha} (-b z)^{-\alpha}}{b\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{a^{2k} b^{-2k} \Gamma(2k+\alpha+1, -b z)}{(2k+1) k!}$$

06.28.21.0016.01

$$\int z^n e^{b z} \operatorname{erfi}(a z) \, dz = -\frac{a\, n! \,(-b)^{-n-1}}{\sqrt{\pi}} \exp\left(-\frac{b^2}{4a^2}\right) \sum_{m=0}^{n} \frac{(-b)^m \left(a^2\right)^{\frac{1}{2}(-m-1)}}{m!} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{b}{2\sqrt{a^2}}\right)^{m-k} \left(\frac{b}{2\sqrt{a^2}} + \sqrt{a^2}\, z\right)^{k+1} \left(-\left(\frac{b}{2\sqrt{a^2}} + \sqrt{a^2}\, z\right)^2\right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\frac{b}{2\sqrt{a^2}} + \sqrt{a^2}\, z\right)^2\right) - (-b)^{-n-1} \operatorname{erfi}(a z) \, \Gamma(n+1, -b z) \,/;\, n \in \mathbb{N}$$

06.28.21.0017.01

$$\int z\, e^{b z} \operatorname{erfi}(a z) \, dz = \frac{1}{2 a^2 b^2 \sqrt{\pi}} \left(e^{-\frac{b^2}{4a^2}} \left(\sqrt{\pi} \left(2 \exp\left(\frac{b^2}{4a^2} + z b\right) (b z - 1) \operatorname{erfi}(a z)\, a^2 + \left(2a^2 + b^2\right) \operatorname{erfi}\left(\frac{b}{2a} + a z\right)\right) - 2 a b \exp\left(\frac{\left(2 z a^2 + b\right)^2}{4a^2}\right)\right)\right)$$

06.28.21.0018.01

$$\int z^2 e^{b z} \operatorname{erfi}(a z) \, dz = \frac{1}{4 a^4 b^3 \sqrt{\pi}} \left(e^{-\frac{b^2}{4a^2}} \left(\sqrt{\pi} \left(4 a^4 \exp\left(\frac{b^2}{4a^2} + z b\right) (b z (b z - 2) + 2) \operatorname{erfi}(a z) - \left(8 a^4 + 2 b^2 a^2 + b^4\right) \operatorname{erfi}\left(\frac{b}{2a} + a z\right)\right) - 2 a b \exp\left(\frac{\left(2 z a^2 + b\right)^2}{4a^2}\right) \left(2 a^2 (b z - 2) - b^2\right)\right)\right)$$

06.28.21.0019.01

$$\int z^3 e^{b z} \operatorname{erfi}(a z) \, dz = \frac{1}{8 a^6 b^4 \sqrt{\pi}} \left(e^{-\frac{b^2}{4 a^2}} \left(\sqrt{\pi} \left(8 \exp\left(\frac{b^2}{4 a^2} + z b \right) (b z (b z (b z - 3) + 6) - 6) \operatorname{erfi}(a z) a^6 + \left(48 a^6 + 12 b^2 a^4 + b^6 \right) \operatorname{erfi}\left(\frac{b}{2 a} + a z \right) \right) - 2 a b \exp\left(\frac{\left(2 z a^2 + b \right)^2}{4 a^2} \right) \left(4 (b z (b z - 3) + 6) a^4 - 2 b^2 (b z - 1) a^2 + b^4 \right) \right) \right)$$

06.28.21.0020.01

$$\int z^{\alpha-1} e^{b z^2} \operatorname{erfi}(a z) \, dz = -\frac{a z^{\alpha+1}}{\sqrt{\pi} \left(-b z^2 \right)^{\frac{\alpha+1}{2}}} \sum_{k=0}^{\infty} \frac{(-1)^k b^{-k} a^{2k}}{(2k+1) k!} \Gamma\left(\frac{\alpha+1}{2} + k, -b z^2 \right)$$

06.28.21.0021.01

$$\int z^{\alpha-1} e^{-a^2 z^2} \operatorname{erfi}(a z) \, dz = \frac{a}{2} z^{\alpha+1} \Gamma\left(\frac{\alpha+1}{2} \right) {}_2\tilde{F}_2\left(1, \frac{\alpha+1}{2}; \frac{3}{2}, \frac{\alpha+3}{2}; -a^2 z^2 \right)$$

06.28.21.0022.01

$$\int z e^{-a^2 z^2} \operatorname{erfi}(a z) \, dz = \frac{z}{a \sqrt{\pi}} - \frac{e^{-a^2 z^2} \operatorname{erfi}(a z)}{2 a^2}$$

06.28.21.0023.01

$$\int z e^{b z^2} \operatorname{erfi}(c + a z) \, dz = \frac{e^{b z^2} \operatorname{erfi}(c + a z)}{2 b} - \frac{a}{2 b \sqrt{a^2 + b}} \exp\left(c^2 - \frac{a^2 c^2}{a^2 + b} \right) \operatorname{erfi}\left(\frac{z a^2 + c a + b z}{\sqrt{a^2 + b}} \right)$$

06.28.21.0024.01

$$\int z e^{b z^2} \operatorname{erfi}(a z) \, dz = \frac{e^{b z^2} \operatorname{erfi}(a z)}{2 b} - \frac{a}{2 b \sqrt{a^2 + b}} \operatorname{erfi}\left(\frac{z a^2 + b z}{\sqrt{a^2 + b}} \right)$$

06.28.21.0025.01

$$\int z^3 e^{b z^2} \operatorname{erfi}(a z) \, dz = \frac{1}{2 b^2} \left(\frac{a b z^3}{\sqrt{\pi} \left(-\left(a^2 + b \right) z^2 \right)^{3/2}} \left(e^{\left(a^2 + b \right) z^2} \sqrt{-\left(a^2 + b \right) z^2} - \frac{\sqrt{\pi}}{2} \left(\operatorname{erf}\left(\sqrt{-\left(a^2 + b \right) z^2} \right) - 1 \right) \right) + e^{b z^2} \left(b z^2 - 1 \right) \operatorname{erfi}(a z) + \frac{a \operatorname{erfi}\left(\sqrt{a^2 + b} \, z \right)}{\sqrt{a^2 + b}} \right)$$

06.28.21.0026.01

$$\int \frac{e^{b z^2} \operatorname{erfi}(a z)}{z} \, dz = -\frac{a z}{\sqrt{-\pi b z^2}} \sum_{k=0}^{\infty} \frac{(-1)^k b^{-k} a^{2k} \Gamma\left(k + \frac{1}{2}, -b z^2 \right)}{(2k+1) k!}$$

Involving trigonometric functions

Involving sin

06.28.21.0027.01

$$\int \sin(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{1}{2\,b}\exp\left(\frac{b^2}{4\,a^2}\right)\left(\text{erfi}\left(\frac{2\,a^2\,z - i\,b}{2\,a}\right) + \text{erfi}\left(\frac{2\,z\,a^2 + b\,i}{2\,a}\right)\right) - \frac{\cos(b\,z)\,\text{erfi}(a\,z)}{b}$$

06.28.21.0028.01

$$\int \sin\left(b\,z^2\right)\text{erfi}(a\,z)\,dz = -\frac{1}{2\sqrt{\pi}\,b}\left(\sum_{k=0}^{\infty}\frac{i^k\,a^{2k+1}\,b^{-k}\,\Gamma\left(k+1,\,-i\,b\,z^2\right)}{(2\,k+1)\,k!} + \sum_{k=0}^{\infty}\frac{i^{-k}\,a^{2k+1}\,b^{-k}\,\Gamma\left(k+1,\,i\,b\,z^2\right)}{(2\,k+1)\,k!}\right)$$

Involving cos

06.28.21.0029.01

$$\int \cos(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{i}{2\,b}\exp\left(\frac{b^2}{4\,a^2}\right)\left(\text{erfi}\left(\frac{2\,z\,a^2 + b\,i}{2\,a}\right) + \text{erfi}\left(\frac{i\,b - 2\,a^2\,z}{2\,a}\right)\right) + \frac{\text{erfi}(a\,z)\sin(b\,z)}{b}$$

06.28.21.0030.01

$$\int \cos\left(b\,z^2\right)\text{erfi}(a\,z)\,dz = -\frac{i}{2\sqrt{\pi}\,b}\left(\sum_{k=0}^{\infty}\frac{b^{-k}\,i^k\,a^{2k+1}\,\Gamma\left(k+1,\,-i\,b\,z^2\right)}{(2\,k+1)\,k!} - \sum_{k=0}^{\infty}\frac{b^{-k}\,i^{-k}\,a^{2k+1}\,\Gamma\left(k+1,\,i\,b\,z^2\right)}{(2\,k+1)\,k!}\right)$$

Involving trigonometric functions and a power function

Involving sin and power

06.28.21.0031.01

$$\int z^{\alpha-1}\sin(b\,z)\,\text{erfi}(a\,z)\,dz = -\frac{a\,z^{\alpha}}{b\sqrt{\pi}}\sum_{k=0}^{\infty}\frac{(-1)^k\,a^{2k}\,b^{-2k}}{(2\,k+1)\,k!}\left(\Gamma(2\,k+\alpha+1,\,-i\,b\,z)\,(-i\,b\,z)^{-\alpha} + (i\,b\,z)^{-\alpha}\,\Gamma(2\,k+\alpha+1,\,i\,b\,z)\right)$$

06.28.21.0032.01

$$\int z^n \sin(b z)\, \mathrm{erfi}(a z)\, dz = \frac{b^{-2n}}{2 b \sqrt{\pi}} \exp\left(\frac{b^2}{4 a^2}\right) \left(-a\, n!\, (-i b)^n \sum_{m=0}^{n} \frac{1}{m!} (i b)^m \left(a^2\right)^{\frac{1}{2}(-m-1)} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{-i b}{2\sqrt{a^2}}\right)^{m-k} \left(\sqrt{a^2}\, z - \frac{i b}{2\sqrt{a^2}}\right)^{k+1} \left(-\left(\sqrt{a^2}\, z - \frac{i b}{2\sqrt{a^2}}\right)^2\right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\sqrt{a^2}\, z - \frac{i b}{2\sqrt{a^2}}\right)^2\right) + -(i b)^n \exp\left(-\frac{b^2}{4a^2}\right) \sqrt{\pi}\, \mathrm{erfi}(a z) \left(\Gamma(n+1, -i b z) + (-1)^n \Gamma(n+1, i b z)\right) - a (i b)^n n! \sum_{m=0}^{n} \frac{1}{m!} (-i b)^m \left(a^2\right)^{\frac{1}{2}(-m-1)} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{i b}{2\sqrt{a^2}}\right)^{m-k} \left(\sqrt{a^2}\, z + \frac{i b}{2\sqrt{a^2}}\right)^{k+1} \left(-\left(\sqrt{a^2}\, z + \frac{i b}{2\sqrt{a^2}}\right)^2\right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\sqrt{a^2}\, z + \frac{i b}{2\sqrt{a^2}}\right)^2\right)\right) /;\, n \in \mathbb{N}$$

06.28.21.0033.01

$$\int z \sin(b z)\, \mathrm{erfi}(a z)\, dz = \frac{1}{4 a^2 b^2 \sqrt{\pi}} \left(e^{-i b z} \left(2 e^{\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)} i \sqrt{\pi}\, \mathrm{erfi}\left(\frac{2 z a^2 + b i}{2 a}\right) a^2 - 2\sqrt{\pi} \left(-i + b z + e^{2 i b z} (i + b z)\right) \mathrm{erfi}(a z)\, a^2 + 2 b e^{a^2 z^2} a + 2 b e^{z (z a^2 + 2 b i)} a - \left(2 a^2 - b^2\right) e^{\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)} \sqrt{\pi}\, \mathrm{erf}\left(\frac{b}{2a} + a i z\right) - i b^2 e^{\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)} \sqrt{\pi}\, \mathrm{erfi}\left(\frac{2 z a^2 + b i}{2 a}\right)\right)\right)$$

06.28.21.0034.01

$$\int z^2 \sin(b z)\, \mathrm{erfi}(a z)\, dz = \frac{1}{8 a^4 b^3 \sqrt{\pi}} \left(e^{-i b z} \left(-8 e^{\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)} \sqrt{\pi}\, \mathrm{erfi}\left(\frac{2 z a^2 + b i}{2 a}\right) a^4 - 4\sqrt{\pi} \left(b^2 z^2 - 2 i b z + e^{2 i b z} \left(b^2 z^2 + 2 b i z - 2\right) - 2\right) \mathrm{erfi}(a z)\, a^4 - 8 b e^{a^2 z^2} i a^3 + 8 b e^{z (z a^2 + 2 b i)} i a^3 + 4 b^2 e^{a^2 z^2} z a^3 + 4 b^2 e^{z (z a^2 + 2 b i)} z a^3 + 2 b^2 e^{\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)} \sqrt{\pi}\, \mathrm{erfi}\left(\frac{2 z a^2 + b i}{2 a}\right) a^2 - 2 i b^3 e^{z (z a^2 + 2 b i)} a + 2 b^3 e^{a^2 z^2} i a + \left(8 a^4 - 2 b^2 a^2 + b^4\right) e^{\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)} i \sqrt{\pi}\, \mathrm{erf}\left(\frac{b}{2a} + a i z\right) - b^4 e^{\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)} \sqrt{\pi}\, \mathrm{erfi}\left(\frac{2 z a^2 + b i}{2 a}\right)\right)\right)$$

06.28.21.0035.01

$$\int z^3 \sin(b z)\, \operatorname{erfi}(a z)\, dz = \frac{1}{16 a^6 b^4 \sqrt{\pi}} \Bigg(e^{-i b z} \Bigg(-48 i e^{\frac{1}{4} b \left(\frac{b}{a^2}+4 i z\right)} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{2 z a^2 + b i}{2 a}\right) a^6 - 8 \sqrt{\pi} \left(b^3 z^3 - 3 i b^2 z^2 - 6 b z + 6 i + e^{2 i b z} \left(b^3 z^3 + 3 b^2 i z^2 - 6 b z - 6 i\right)\right) \operatorname{erfi}(a z)\, a^6 - 48 b e^{a^2 z^2} a^5 - 48 b e^{z (z a^2 + 2 b i)} a^5 + 8 b^3 e^{a^2 z^2} z^2 a^5 + 8 b^3 e^{z (z a^2 + 2 b i)} z^2 a^5 - 24 i b^2 e^{a^2 z^2} z a^5 + 24 b^2 e^{z (z a^2 + 2 b i)} i z a^5 + 12 b^2 e^{\frac{1}{4} b \left(\frac{b}{a^2}+4 i z\right)} i \sqrt{\pi}\, \operatorname{erfi}\left(\frac{2 z a^2 + b i}{2 a}\right) a^4 + 4 b^3 e^{a^2 z^2} a^3 + 4 b^3 e^{z (z a^2 + 2 b i)} a^3 - 4 i b^4 e^{z (z a^2 + 2 b i)} z a^3 + 4 b^4 e^{a^2 z^2} i z a^3 - 2 b^5 e^{a^2 z^2} a - 2 b^5 e^{z (z a^2 + 2 b i)} a + \left(48 a^6 - 12 b^2 a^4 - b^6\right) e^{\frac{1}{4} b \left(\frac{b}{a^2}+4 i z\right)} \sqrt{\pi}\, \operatorname{erf}\left(\frac{b}{2 a} + a i z\right) + b^6 e^{\frac{1}{4} b \left(\frac{b}{a^2}+4 i z\right)} i \sqrt{\pi}\, \operatorname{erfi}\left(\frac{2 z a^2 + b i}{2 a}\right)\Bigg)\Bigg)$$

06.28.21.0036.01

$$\int z^{\alpha-1} \sin\left(b z^2\right) \operatorname{erfi}(a z)\, dz = \frac{i a z^{\alpha+1}}{2 \sqrt{\pi}} \left(b^2 z^4\right)^{\frac{1}{2}(-\alpha-1)} \left(\left(i b z^2\right)^{\frac{\alpha+1}{2}} \sum_{k=0}^{\infty} \frac{(-i b)^{-k} a^{2 k}\, \Gamma\left(\frac{\alpha+1}{2} + k, -i b z^2\right)}{(2 k + 1)\, k!} - \left(-i b z^2\right)^{\frac{\alpha+1}{2}} \sum_{k=0}^{\infty} \frac{(i b)^{-k} a^{2 k}\, \Gamma\left(\frac{\alpha+1}{2} + k, i b z^2\right)}{(2 k + 1)\, k!}\right)$$

06.28.21.0037.01

$$\int z \sin\left(b z^2\right) \operatorname{erfi}(c + a z)\, dz = \frac{1}{4 b \left(a^4 + b^2\right)} \left(\exp\left(-\frac{2 a^4 c^2}{a^4 + b^2}\right) \left(a \sqrt{a^2 + b i}\, \left(a^2 - i b\right) \exp\left(\left(\frac{a^2}{a^2 - i b} + 1\right) c^2\right) \operatorname{erfi}\left(\frac{z a^2 + c a + b i z}{\sqrt{a^2 + b i}}\right) + a \left(a^2 + b i\right) \sqrt{a^2 - i b}\, \exp\left(\left(\frac{a^2}{a^2 + b i} + 1\right) c^2\right) \operatorname{erfi}\left(\frac{z a^2 + c a - i b z}{\sqrt{a^2 - i b}}\right) - 2 \left(a^4 + b^2\right) e^{\frac{2 a^4 c^2}{a^4 + b^2}} \cos\left(b z^2\right) \operatorname{erfi}(c + a z)\right)\right)$$

06.28.21.0038.01

$$\int z \sin\left(b z^2\right) \operatorname{erfi}(a z)\, dz = \frac{1}{4 b \left(a^4 + b^2\right)} \left(-2 \left(a^4 + b^2\right) \cos\left(b z^2\right) \operatorname{erfi}(a z) + a \sqrt{a^2 + b i}\, \left(a^2 - i b\right) \operatorname{erfi}\left(\sqrt{a^2 + b i}\, z\right) + a \left(a^2 + b i\right) \sqrt{a^2 - i b}\, \operatorname{erfi}\left(\sqrt{a^2 - i b}\, z\right)\right)$$

06.28.21.0039.01

$$\int z^3 \sin\left(b z^2\right) \operatorname{erfi}(a z)\, dz = \frac{1}{4 b^2} \Bigg(\frac{1}{\sqrt{\pi}} \Bigg(a b z^3 \Bigg(\left(\frac{1}{2} \sqrt{\pi} \left(\operatorname{erf}\left(\sqrt{-\left(a^2 + b i\right) z^2}\right) - 1\right) - e^{\left(a^2 + b i\right) z^2} \sqrt{-\left(a^2 + b i\right) z^2}\right) \Big/ \left(-\left(a^2 + b i\right) z^2\right)^{3/2} + \left(\frac{1}{2} \sqrt{\pi} \left(\operatorname{erf}\left(\sqrt{-\left(a^2 - i b\right) z^2}\right) - 1\right) - e^{\left(a^2 - i b\right) z^2} \sqrt{-\left(a^2 - i b\right) z^2}\right) \Big/ \left(-\left(a^2 - i b\right) z^2\right)^{3/2}\Bigg) + \frac{1}{a^4 + b^2} \left(a \left(\left(i a^2 + b\right) \sqrt{a^2 + b i}\, \operatorname{erfi}\left(\sqrt{a^2 + b i}\, z\right) + \left(b - i a^2\right) \sqrt{a^2 - i b}\, \operatorname{erfi}\left(\sqrt{a^2 - i b}\, z\right)\right)\right)\Bigg) - 2 \operatorname{erfi}(a z) \left(b z^2 \cos\left(b z^2\right) - \sin\left(b z^2\right)\right)\Bigg)$$

06.28.21.0040.01

$$\int \frac{\sin(b z^2)\,\mathrm{erfi}(a z)}{z}\, dz = \frac{i a z}{2\sqrt{-\pi i b z^2}} \sum_{k=0}^{\infty} \frac{(-i b)^{-k} a^{2k}\, \Gamma\left(k+\frac{1}{2}, -i b z^2\right)}{(2k+1)\, k!} - \frac{i a z}{2\sqrt{\pi i b z^2}} \sum_{k=0}^{\infty} \frac{(i b)^{-k} a^{2k}\, \Gamma\left(k+\frac{1}{2}, i b z^2\right)}{(2k+1)\, k!}$$

Involving cos and power

06.28.21.0041.01

$$\int z^{\alpha-1} \cos(b z)\, \mathrm{erfi}(a z)\, dz = \frac{i a z^{\alpha}}{b\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{(-1)^k a^{2k} b^{-2k}}{(2k+1)\, k!} \left((i b z)^{-\alpha}\, \Gamma(2k+\alpha+1, i b z) - (-i b z)^{-\alpha}\, \Gamma(2k+\alpha+1, -i b z)\right)$$

06.28.21.0042.01

$$\int z^n \cos(b z)\, \mathrm{erfi}(a z)\, dz =$$

$$\frac{i b^{-2n}}{2 b\sqrt{\pi}} \exp\left(\frac{b^2}{4a^2}\right) \Bigg(a\, n!\, (-i b)^n \sum_{m=0}^{n} \frac{(i b)^m (a^2)^{\frac{1}{2}(-m-1)}}{m!} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{-i b}{2\sqrt{a^2}}\right)^{m-k} \left(\sqrt{a^2}\, z - \frac{i b}{2\sqrt{a^2}}\right)^{k+1}$$

$$\left(-\left(\sqrt{a^2}\, z - \frac{i b}{2\sqrt{a^2}}\right)^2\right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\sqrt{a^2}\, z - \frac{i b}{2\sqrt{a^2}}\right)^2\right) -$$

$$a\, n!\, (i b)^n \sum_{m=0}^{n} \frac{(-i b)^m (a^2)^{\frac{1}{2}(-m-1)}}{m!} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{i b}{2\sqrt{a^2}}\right)^{m-k} \left(\sqrt{a^2}\, z + \frac{i b}{2\sqrt{a^2}}\right)^{k+1}$$

$$\left(-\left(\sqrt{a^2}\, z + \frac{i b}{2\sqrt{a^2}}\right)^2\right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\sqrt{a^2}\, z + \frac{i b}{2\sqrt{a^2}}\right)^2\right)\Bigg) -$$

$$\sqrt{\pi}\, (i b)^n e^{-\frac{b^2}{4a^2}}\, \mathrm{erfi}(a z)\, (\Gamma(n+1, -i b z) - (-1)^n\, \Gamma(n+1, i b z))\ /;\ n \in \mathbb{N}$$

06.28.21.0043.01

$$\int z \cos(b z)\, \mathrm{erfi}(a z)\, dz = \frac{1}{4 a^2 b^2 \sqrt{\pi}}$$

$$\left(e^{-i b z}\left(-2 \exp\left(\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)\right) \sqrt{\pi}\, \mathrm{erfi}\left(\frac{2 z a^2 + b i}{2a}\right) a^2 + 2\sqrt{\pi}\, \mathrm{erfi}(a z) \left(2 b e^{i b z} z \sin(b z) + e^{2 i b z} + 1\right) a^2 - 2 b e^{a^2 z^2}\, i a +\right.\right.$$

$$\left.\left. 2 b e^{z(z a^2 + 2 b i)}\, i a + \left(2a^2 - b^2\right) \exp\left(\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)\right) i \sqrt{\pi}\, \mathrm{erf}\left(\frac{b}{2a} + a i z\right) + b^2 e^{\frac{1}{4} b \left(\frac{b}{a^2} + 4 i z\right)} \sqrt{\pi}\, \mathrm{erfi}\left(\frac{2 z a^2 + b i}{2a}\right)\right)\right)$$

06.28.21.0044.01

$$\int z^2 \cos(b\,z)\,\mathrm{erfi}(a\,z)\,dz == \frac{1}{8\,a^4\,b^3\,\sqrt{\pi}} \left(e^{-i\,b\,z}\left(-8\,i\exp\left(\frac{1}{4}\,b\left(\frac{b}{a^2}+4\,i\,z\right)\right)\sqrt{\pi}\;\mathrm{erfi}\left(\frac{2\,z\,a^2+b\,i}{2\,a}\right)a^4 + 8\sqrt{\pi}\;\mathrm{erfi}(a\,z)\left(b^2\,e^{i\,b\,z}\sin(b\,z)\,z^2+b\,z-i+e^{2\,i\,b\,z}\,(i+b\,z)\right)a^4 - 8\,b\,e^{a^2\,z^2}\,a^3 - 8\,b\,e^{z\left(z\,a^2+2\,b\,i\right)}\,a^3 - 4\,i\,b^2\,e^{a^2\,z^2}\,z\,a^3 + 4\,b^2\,e^{z\left(z\,a^2+2\,b\,i\right)}\,i\,z\,a^3 + 2\,b^2\exp\left(\frac{1}{4}\,b\left(\frac{b}{a^2}+4\,i\,z\right)\right)i\sqrt{\pi}\;\mathrm{erfi}\left(\frac{2\,z\,a^2+b\,i}{2\,a}\right)a^2 + 2\,b^3\,e^{a^2\,z^2}\,a + 2\,b^3\,e^{z\left(z\,a^2+2\,b\,i\right)}\,a + \left(8\,a^4-2\,b^2\,a^2+b^4\right)\exp\left(\frac{1}{4}\,b\left(\frac{b}{a^2}+4\,i\,z\right)\right)\sqrt{\pi}\;\mathrm{erf}\left(\frac{b}{2\,a}+a\,i\,z\right) - i\,b^4\exp\left(\frac{1}{4}\,b\left(\frac{b}{a^2}+4\,i\,z\right)\right)\sqrt{\pi}\;\mathrm{erfi}\left(\frac{2\,z\,a^2+b\,i}{2\,a}\right)\right)\right)$$

06.28.21.0045.01

$$\int z^3 \cos(b\,z)\,\mathrm{erfi}(a\,z)\,dz == \frac{1}{16\,a^6\,b^4\,\sqrt{\pi}}\left(e^{-i\,b\,z}\left(48\,e^{\frac{1}{4}\,b\left(\frac{b}{a^2}+4\,i\,z\right)}\sqrt{\pi}\;\mathrm{erfi}\left(\frac{2\,z\,a^2+b\,i}{2\,a}\right)a^6 + 8\sqrt{\pi}\;\mathrm{erfi}(a\,z)\left(2\,b^3\,e^{i\,b\,z}\sin(b\,z)\,z^3+3\left(b^2\,z^2-2\,i\,b\,z+e^{2\,i\,b\,z}\left(b^2\,z^2+2\,b\,i\,z-2\right)-2\right)\right)a^6 - 48\,i\,b\,e^{z\left(z\,a^2+2\,b\,i\right)}\,a^5 - 8\,i\,b^3\,e^{a^2\,z^2}\,z^2\,a^5 + 8\,b^3\,e^{z\left(z\,a^2+2\,b\,i\right)}\,i\,z^2\,a^5 + 48\,b\,e^{a^2\,z^2}\,i\,a^5 - 24\,b^2\,e^{a^2\,z^2}\,z\,a^5 - 24\,b^2\,e^{z\left(z\,a^2+2\,b\,i\right)}\,z\,a^5 - 12\,b^2\,e^{\frac{1}{4}\,b\left(\frac{b}{a^2}+4\,i\,z\right)}\sqrt{\pi}\;\mathrm{erfi}\left(\frac{2\,z\,a^2+b\,i}{2\,a}\right)a^4 - 4\,i\,b^3\,e^{a^2\,z^2}\,a^3 + 4\,b^3\,e^{z\left(z\,a^2+2\,b\,i\right)}\,i\,a^3 + 4\,b^4\,e^{a^2\,z^2}\,z\,a^3 + 4\,b^4\,e^{z\left(z\,a^2+2\,b\,i\right)}\,z\,a^3 - 2\,i\,b^5\,e^{z\left(z\,a^2+2\,b\,i\right)}\,a + 2\,b^5\,e^{a^2\,z^2}\,i\,a - i\left(48\,a^6-12\,b^2\,a^4-b^6\right)e^{\frac{1}{4}\,b\left(\frac{b}{a^2}+4\,i\,z\right)}\sqrt{\pi}\;\mathrm{erf}\left(\frac{b}{2\,a}+a\,i\,z\right) - b^6\,e^{\frac{1}{4}\,b\left(\frac{b}{a^2}+4\,i\,z\right)}\sqrt{\pi}\;\mathrm{erfi}\left(\frac{2\,z\,a^2+b\,i}{2\,a}\right)\right)\right)$$

06.28.21.0046.01

$$\int z^{\alpha-1}\cos\left(b\,z^2\right)\mathrm{erfi}(a\,z)\,dz == \frac{a\,z^{\alpha+1}}{2\sqrt{\pi}}\left(b^2\,z^4\right)^{\frac{1}{2}(-\alpha-1)}\left(-\left(i\,b\,z^2\right)^{\frac{\alpha+1}{2}}\sum_{k=0}^{\infty}\frac{(-i\,b)^{-k}\,a^{2\,k}\,\Gamma\left(\frac{\alpha+1}{2}+k,\,-i\,b\,z^2\right)}{(2\,k+1)\,k!} - \left(-i\,b\,z^2\right)^{\frac{\alpha+1}{2}}\sum_{k=0}^{\infty}\frac{(i\,b)^{-k}\,a^{2\,k}\,\Gamma\left(\frac{\alpha+1}{2}+k,\,i\,b\,z^2\right)}{(2\,k+1)\,k!}\right)$$

06.28.21.0047.01

$$\int z\cos\left(b\,z^2\right)\mathrm{erfi}(c+a\,z)\,dz == \frac{1}{b\left(a^4+b^2\right)}\left(\left(\frac{1}{8}+\frac{i}{8}\right)e^{-\frac{a^2\,c^2}{a^2-i\,b}}\left(\sqrt{2}\;a\left(a^2-i\,b\right)\sqrt{b-i\,a^2}\;e^{\frac{\left(a^4+2\,b\,i\,a^2+b^2\right)c^2}{a^4+b^2}}\;\mathrm{erf}\left(\frac{(1+i)\left(z\,a^2+c\,a+b\,i\,z\right)}{\sqrt{2}\;\sqrt{b-i\,a^2}}\right) - \left(a^2+b\,i\right)\left(\sqrt{2}\;a\sqrt{i\,a^2+b}\;e^{c^2}\;\mathrm{erfi}\left(\frac{(1+i)\left(z\,a^2+c\,a-i\,b\,z\right)}{\sqrt{2}\;\sqrt{i\,a^2+b}}\right) + \left(i\,a^2+b\right)e^{\frac{a^2\,c^2}{a^2-i\,b}}\,(2+2\,i)\,\mathrm{erfi}(c+a\,z)\sin\left(b\,z^2\right)\right)\right)\right)$$

06.28.21.0048.01

$$\int z\cos\left(b\,z^2\right)\mathrm{erfi}(a\,z)\,dz == \frac{1}{4\,b\left(a^4+b^2\right)}\left(\sqrt[4]{-1}\;a\sqrt{b-i\,a^2}\;\left(i\,a^2+b\right)\mathrm{erfi}\left(\sqrt[4]{-1}\;\sqrt{b-i\,a^2}\;z\right) + \sqrt[4]{-1}\;a\sqrt{i\,a^2+b}\;\left(a^2+b\,i\right)\mathrm{erfi}\left((-1)^{3/4}\sqrt{i\,a^2+b}\;z\right) + 2\left(a^4+b^2\right)\mathrm{erfi}(a\,z)\sin\left(b\,z^2\right)\right)$$

06.28.21.0049.01

$$\int z^3 \cos(b z^2) \operatorname{erfi}(a z) \, dz = \frac{1}{2 b^2} \left(\frac{1}{2\sqrt{\pi}} \left(i a b z^3 \left(\left(\frac{1}{2} \sqrt{\pi} \left(\operatorname{erf}\left(\sqrt{-(a^2 + b i) z^2} \right) - 1 \right) - e^{(a^2+b i) z^2} \sqrt{-(a^2 + b i) z^2} \right) \Big/ \left(-(a^2 + b i) z^2\right)^{3/2} + \left(e^{(a^2 - i b) z^2} \sqrt{-(a^2 - i b) z^2} - \frac{1}{2} \sqrt{\pi} \left(\operatorname{erf}\left(\sqrt{-(a^2 - i b) z^2} \right) - 1 \right) \right) \Big/ \left(-(a^2 - i b) z^2 \right)^{3/2} \right) + \frac{1}{2(a^4 + b^2)} \left(\sqrt[4]{-1} \, a \left(\sqrt{i a^2 + b} \operatorname{erf}\left(\frac{(1+i) \sqrt{i a^2 + b} \, z}{\sqrt{2}} \right) a^2 - (a^2 - i b) \sqrt{b - i a^2} \operatorname{erfi}\left(\sqrt[4]{-1} \sqrt{b - i a^2} \, z \right) + b \sqrt{i a^2 + b} \operatorname{erfi}\left((-1)^{3/4} \sqrt{i a^2 + b} \, z \right) \right) \right) \right) + \operatorname{erfi}(a z) \left(b \sin(b z^2) z^2 + \cos(b z^2) \right) \right)$$

06.28.21.0050.01

$$\int \frac{\cos(b z^2) \operatorname{erfi}(a z)}{z} \, dz = -\frac{a z}{2 \sqrt{-\pi i b z^2}} \sum_{k=0}^{\infty} \frac{(-i b)^{-k} a^{2k} \Gamma\left(k + \frac{1}{2}, -i b z^2\right)}{(2k+1) k!} - \frac{a z}{2 \sqrt{\pi i b z^2}} \sum_{k=0}^{\infty} \frac{(i b)^{-k} a^{2k} \Gamma\left(k + \frac{1}{2}, i b z^2\right)}{(2k+1) k!}$$

Involving exponential function and trigonometric functions

Involving exp and sin

06.28.21.0051.01

$$\int e^{b z} \sin(c z) \operatorname{erfi}(a z) \, dz = \frac{1}{2(b^2 + c^2)} \left(e^{-\frac{b^2}{2a^2}} \left(e^{\frac{b^2 - 2 i c b + c^2}{4a^2}} \left((c + b i) \operatorname{erfi}\left(\frac{2 z a^2 + b + c i}{2a} \right) + (c - i b) e^{\frac{i b c}{a^2}} \operatorname{erfi}\left(\frac{2 z a^2 + b - i c}{2a} \right) \right) + 2 e^{\frac{b^2}{2a^2} + z b} \operatorname{erfi}(a z) (b \sin(c z) - c \cos(c z)) \right) \right)$$

06.28.21.0052.01

$$\int e^{b z^2} \sin(c z^2) \operatorname{erfi}(a z) \, dz = \frac{i}{2\sqrt{\pi} \, (b - i c)} \sum_{k=0}^{\infty} \frac{(-b + i c)^{-k} a^{2k+1} \Gamma\left(k + 1, -(b - i c) z^2\right)}{(2k+1) k!} - \frac{i}{2\sqrt{\pi} \, (b + c i)} \sum_{k=0}^{\infty} \frac{(-b - c i)^{-k} a^{2k+1} \Gamma\left(k + 1, -(b + c i) z^2\right)}{(2k+1) k!}$$

Involving exp and cos

06.28.21.0053.01

$$\int e^{b z} \cos(c z) \operatorname{erfi}(a z) \, dz = \frac{1}{2(b^2 + c^2)} \left(e^{-\frac{b^2}{2a^2}} \left(2 e^{\frac{b^2}{2a^2} + z b} \operatorname{erfi}(a z) (b \cos(c z) + c \sin(c z)) - e^{\frac{b^2 - 2 i c b + c^2}{4a^2}} \left((b - i c) \operatorname{erfi}\left(\frac{2 z a^2 + b + c i}{2a} \right) + (b + c i) e^{\frac{i b c}{a^2}} \operatorname{erfi}\left(\frac{2 z a^2 + b - i c}{2a} \right) \right) \right) \right)$$

06.28.21.0054.01

$$\int e^{b z^2} \cos(c z^2)\, \text{erfi}(a z)\, dz = \frac{1}{2\sqrt{\pi}\,(b + c\,i)} \sum_{k=0}^{\infty} \frac{(-b - c\,i)^{-k}\, a^{2k+1}\, \Gamma(k+1, -(b + c\,i)\, z^2)}{(2k+1)\, k!} + \frac{1}{2\sqrt{\pi}\,(b - i\,c)} \sum_{k=0}^{\infty} \frac{(-b + i\,c)^{-k}\, a^{2k+1}\, \Gamma(k+1, -(b - i\,c)\, z^2)}{(2k+1)\, k!}$$

Involving power, exponential and trigonometric functions

Involving power, exp and sin

06.28.21.0055.01

$$\int z^{\alpha-1} e^{b z} \sin(c z)\, \text{erfi}(a z)\, dz = \frac{i\, a\, z^{\alpha}\, (-(b - i\,c)\, z)^{-\alpha}}{(b - i\,c)\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{a^{2k}\, (b - i\,c)^{-2k}}{(2k+1)\, k!} \Gamma(2k + \alpha + 1, -(b - i\,c)\, z) - \frac{i\, a\, z^{\alpha}\, (-(b + c\,i)\, z)^{-\alpha}}{(b + c\,i)\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{a^{2k}\, (b + c\,i)^{-2k}}{(2k+1)\, k!} \Gamma(2k + \alpha + 1, -(b + c\,i)\, z)$$

06.28.21.0056.01

$$\int z^n e^{b z} \sin(c z)\, \text{erfi}(a z)\, dz = -\frac{1}{2}\, i\, \text{erfi}(a z)\, \Gamma(n+1, (i\,c - b)\, z)\, (i\,c - b)^{-n-1} + \frac{1}{2}\, (-b - i\,c)^{-n-1}\, i\, \text{erfi}(a z)\, \Gamma(n+1, (-b - i\,c)\, z) +$$
$$\frac{1}{2\sqrt{\pi}} \left(i\, a\, (-b - i\,c)^{-n-1}\, e^{-\frac{(b+c\,i)^2}{4a^2}}\, n! \sum_{m=0}^{n} \frac{1}{m!} \left((-(b + c\,i))^m\, (a^2)^{\frac{1}{2}(-m-1)} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{b + c\,i}{2\sqrt{a^2}} \right)^{m-k} \left(\frac{b + c\,i}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^{k+1} \left(-\left(\frac{b + c\,i}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^2 \right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\frac{b + c\,i}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^2 \right) \right) \right) -$$
$$\frac{1}{2\sqrt{\pi}} \left(i\, a\, (i\,c - b)^{-n-1}\, e^{-\frac{(b-i\,c)^2}{4a^2}}\, n! \sum_{m=0}^{n} \frac{1}{m!} \left((-(b - i\,c))^m\, (a^2)^{\frac{1}{2}(-m-1)} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{b - i\,c}{2\sqrt{a^2}} \right)^{m-k} \left(\frac{b - i\,c}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^{k+1} \left(-\left(\frac{b - i\,c}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^2 \right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\frac{b - i\,c}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^2 \right) \right) \right) /;\, n \in \mathbb{N}$$

06.28.21.0057.01

$$\int z\, e^{b z} \sin(c z)\, \text{erfi}(a z)\, dz = -\frac{i}{4 a^2 \sqrt{\pi}} e^{a^2 z^2} \left(\frac{1}{(b - i c)^2} \left(-2 e^{z\left(-z a^2+b-i c\right)} \sqrt{\pi}\, (b z - i c z - 1)\, \text{erfi}(a z)\, a^2 + 2 (b - i c)\, e^{(b-i c) z} a - \left(2 a^2 + (b - i c)^2\right) e^{-\frac{(b-i c)^2}{4 a^2}-a^2 z^2} \sqrt{\pi}\, \text{erfi}\left(\frac{b - i c}{2 a} + a z\right)\right) - \frac{1}{(b + c i)^2} \left(-2 e^{z\left(-z a^2+b+c i\right)} \sqrt{\pi}\, (b z + c i z - 1)\, \text{erfi}(a z)\, a^2 + 2 (b + c i)\, e^{(b+c i) z} a - \left(2 a^2 + (b + c i)^2\right) e^{-\frac{(b+c i)^2}{4 a^2}-a^2 z^2} \sqrt{\pi}\, \text{erfi}\left(\frac{b + c i}{2 a} + a z\right)\right)\right)$$

06.28.21.0058.01

$$\int z^2 e^{b z} \sin(c z)\, \text{erfi}(a z)\, dz = \frac{1}{8 a^4 \sqrt{\pi}} \left(i e^{a^2 z^2} \left(\frac{1}{(b - i c)^3} \left(4 e^{z\left(-z a^2+b-i c\right)} \sqrt{\pi} \left((b - i c)^2 z^2 - 2 (b - i c) z + 2\right) \text{erfi}(a z)\, a^4 + 2 (b - i c)\, e^{(b-i c) z} \left((-2 b z + 2 c i z + 4)\, a^2 + (b - i c)^2\right) a - \left(8 a^4 + 2 (b - i c)^2 a^2 + (b - i c)^4\right) e^{-\frac{(b-i c)^2}{4 a^2}-a^2 z^2} \sqrt{\pi}\, \text{erfi}\left(\frac{b - i c}{2 a} + a z\right)\right) - \frac{1}{(b + c i)^3} \left(4 e^{z\left(-z a^2+b+c i\right)} \sqrt{\pi} \left((b + c i)^2 z^2 - 2 (b + c i) z + 2\right) \text{erfi}(a z)\, a^4 + 2 (b + c i)\, e^{(b+c i) z} \left((b + c i)^2 - 2 a^2 (b z + c i z - 2)\right) a - \left(8 a^4 + 2 (b + c i)^2 a^2 + (b + c i)^4\right) e^{-\frac{(b+c i)^2}{4 a^2}-a^2 z^2} \sqrt{\pi}\, \text{erfi}\left(\frac{b + c i}{2 a} + a z\right)\right)\right)\right)$$

06.28.21.0059.01

$$\int z^3 e^{b z} \sin(c z)\, \text{erfi}(a z)\, dz = -\frac{i}{16 a^6 \sqrt{\pi}} e^{a^2 z^2} \left(\frac{1}{(b - i c)^4} \left(-8 e^{z\left(-z a^2+b-i c\right)} \sqrt{\pi} \left((b - i c)^3 z^3 - 3 (b - i c)^2 z^2 + 6 (b - i c) z - 6\right) \text{erfi}(a z)\, a^6 + 2 (b - i c)\, e^{(b-i c) z} \left(4 \left((b - i c)^2 z^2 - 3 (b - i c) z + 6\right) a^4 - 2 (b - i c)^2 (b z - i c z - 1)\, a^2 + (b - i c)^4\right) a - \left(48 a^6 + 12 (b - i c)^2 a^4 + (b - i c)^6\right) e^{-\frac{(b-i c)^2}{4 a^2}-a^2 z^2} \sqrt{\pi}\, \text{erfi}\left(\frac{b - i c}{2 a} + a z\right)\right) - \frac{1}{(b + c i)^4} \left(-8 e^{z\left(-z a^2+b+c i\right)} \sqrt{\pi} \left((b + c i)^3 z^3 - 3 (b + c i)^2 z^2 + 6 (b + c i) z - 6\right) \text{erfi}(a z)\, a^6 + 2 (b + c i)\, e^{(b+c i) z} \left(4 \left((b + c i)^2 z^2 - 3 (b + c i) z + 6\right) a^4 - 2 (b + c i)^2 (b z + c i z - 1)\, a^2 + (b + c i)^4\right) a - \left(48 a^6 + 12 (b + c i)^2 a^4 + (b + c i)^6\right) e^{-\frac{(b+c i)^2}{4 a^2}-a^2 z^2} \sqrt{\pi}\, \text{erfi}\left(\frac{b + c i}{2 a} + a z\right)\right)\right)$$

06.28.21.0060.01

$$\int z^{\alpha-1} e^{b z^2} \sin(c z^2) \operatorname{erfi}(a z) \, dz = \frac{i}{2\sqrt{\pi}} a z^{\alpha+1} \left(\left(-(b + c i) z^2\right)^{\frac{1}{2}(-\alpha-1)} \sum_{k=0}^{\infty} \frac{(-b - c i)^{-k} a^{2k} \Gamma\left(\frac{\alpha+1}{2} + k, -(b + c i) z^2\right)}{(2k+1) k!} - \left(-(b - i c) z^2\right)^{\frac{1}{2}(-\alpha-1)} \sum_{k=0}^{\infty} \frac{(-b + i c)^{-k} a^{2k} \Gamma\left(\frac{\alpha+1}{2} + k, -(b - i c) z^2\right)}{(2k+1) k!} \right)$$

06.28.21.0061.01

$$\int z e^{b z^2} \sin(c z^2) \operatorname{erfi}(a z) \, dz = \left(a (b - i c) \sqrt{-\left(a^2 + b - i c\right) z^2} \operatorname{erf}\left(\sqrt{-\left(a^2 + b + c i\right) z^2}\right) z - a (b + c i) \sqrt{-\left(a^2 + b + c i\right) z^2} \operatorname{erf}\left(\sqrt{-\left(a^2 + b - i c\right) z^2}\right) z + a b \sqrt{-\left(a^2 + b + c i\right) z^2} \, z + a c i \sqrt{-\left(a^2 + b + c i\right) z^2} \, z - a b \sqrt{-\left(a^2 + b - i c\right) z^2} \, z + a c i \sqrt{-\left(a^2 + b - i c\right) z^2} \, z + 2 c e^{b z^2} i \sqrt{-\left(a^2 + b + c i\right) z^2} \sqrt{-\left(a^2 + b - i c\right) z^2} \cos(c z^2) \operatorname{erfi}(a z) - 2 i b e^{b z^2} \sqrt{-\left(a^2 + b - i c\right) z^2} \sqrt{-\left(a^2 + b + c i\right) z^2} \operatorname{erfi}(a z) \sin(c z^2) \right) \Big/ \left(4 (b - i c)(c - i b) \sqrt{-\left(a^2 + b - i c\right) z^2} \sqrt{-\left(a^2 + b + c i\right) z^2} \right)$$

06.28.21.0062.01

$$\int \frac{e^{b z^2} \sin(c z^2) \operatorname{erfi}(a z)}{z} \, dz = -\frac{i a z}{2\sqrt{\pi}} \left(\frac{1}{\sqrt{-(b - i c) z^2}} \sum_{k=0}^{\infty} \frac{(-b + i c)^{-k} a^{2k} \Gamma\left(k + \frac{1}{2}, -(b - i c) z^2\right)}{(2k+1) k!} - \frac{1}{\sqrt{-(b + c i) z^2}} \sum_{k=0}^{\infty} \frac{(-b - c i)^{-k} a^{2k} \Gamma\left(k + \frac{1}{2}, -(b + c i) z^2\right)}{(2k+1) k!} \right)$$

Involving power, exp and cos

06.28.21.0063.01

$$\int z^{\alpha-1} e^{b z} \cos(c z) \operatorname{erfi}(a z) \, dz = \frac{a z^{\alpha} (-(b + c i) z)^{-\alpha}}{(b + c i)\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{a^{2k} (b + c i)^{-2k}}{(2k+1) k!} \Gamma(2k + \alpha + 1, -(b + c i) z) + \frac{a z^{\alpha} (-(b - i c) z)^{-\alpha}}{(b - i c)\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{a^{2k} (b - i c)^{-2k}}{(2k+1) k!} \Gamma(2k + \alpha + 1, -(b - i c) z)$$

06.28.21.0064.01

$$\int z^n e^{bz}\cos(cz)\,\text{erfi}(az)\,dz = -\frac{1}{2}(ic-b)^{-n-1}\,\text{erfi}(az)\,\Gamma(n+1,(ic-b)z) - \frac{1}{2}(-b-ic)^{-n-1}\,\text{erfi}(az)\,\Gamma(n+1,(-b-ic)z) - \frac{1}{2\sqrt{\pi}}\left(a(-b-ic)^{-n-1}e^{-\frac{(b+ci)^2}{4a^2}}\,n!\sum_{m=0}^{n}\frac{1}{m!}\left((-(b+ci))^m\left(a^2\right)^{\frac{1}{2}(-m-1)}\sum_{k=0}^{m}\binom{m}{k}\left(-\frac{b+ci}{2\sqrt{a^2}}\right)^{m-k}\left(\frac{b+ci}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^{k+1}\left(-\left(\frac{b+ci}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^2\right)^{\frac{1}{2}(-k-1)}\Gamma\left(\frac{k+1}{2},-\left(\frac{b+ci}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^2\right)\right)\right) - \frac{1}{2\sqrt{\pi}}\left(a(ic-b)^{-n-1}e^{-\frac{(b-ic)^2}{4a^2}}\,n!\sum_{m=0}^{n}\frac{1}{m!}\left((-(b-ic))^m\left(a^2\right)^{\frac{1}{2}(-m-1)}\sum_{k=0}^{m}\binom{m}{k}\left(-\frac{b-ic}{2\sqrt{a^2}}\right)^{m-k}\left(\frac{b-ic}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^{k+1}\left(-\left(\frac{b-ic}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^2\right)^{\frac{1}{2}(-k-1)}\Gamma\left(\frac{k+1}{2},-\left(\frac{b-ic}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^2\right)\right)\right)\,/;\,n\in\mathbb{N}$$

06.28.21.0065.01

$$\int z\,e^{bz}\cos(cz)\,\text{erfi}(az)\,dz = -\frac{1}{4a^2\sqrt{\pi}}e^{a^2z^2}\left(\frac{1}{(b+ci)^2}\left(-2e^{z(-za^2+b+ci)}\sqrt{\pi}\,(bz+ciz-1)\,\text{erfi}(az)\,a^2+2(b+ci)e^{(b+ci)z}a-\left(2a^2+(b+ci)^2\right)e^{-\frac{(b+ci)^2}{4a^2}-a^2z^2}\sqrt{\pi}\,\text{erfi}\left(\frac{b+ci}{2a}+az\right)\right)+\frac{1}{(b-ic)^2}\left(-2e^{z(-za^2+b-ic)}\sqrt{\pi}\,(bz-icz-1)\,\text{erfi}(az)\,a^2+2(b-ic)e^{(b-ic)z}a-\left(2a^2+(b-ic)^2\right)e^{-\frac{(b-ic)^2}{4a^2}-a^2z^2}\sqrt{\pi}\,\text{erfi}\left(\frac{b-ic}{2a}+az\right)\right)\right)$$

06.28.21.0066.01

$$\int z^2 e^{bz}\cos(cz)\,\text{erfi}(az)\,dz = \frac{1}{8a^4\sqrt{\pi}}\left(e^{a^2z^2}\left(\frac{1}{(b+ci)^3}\left(4e^{z(-za^2+b+ci)}\sqrt{\pi}\left((b+ci)^2z^2-2(b+ci)z+2\right)\text{erfi}(az)\,a^4+2(b+ci)e^{(b+ci)z}\left((b+ci)^2-2a^2(bz+ciz-2)\right)a-\left(8a^4+2(b+ci)^2a^2+(b+ci)^4\right)e^{-\frac{(b+ci)^2}{4a^2}-a^2z^2}\sqrt{\pi}\,\text{erfi}\left(\frac{b+ci}{2a}+az\right)\right)+\frac{1}{(b-ic)^3}\left(4e^{z(-za^2+b-ic)}\sqrt{\pi}\left((b-ic)^2z^2-2(b-ic)z+2\right)\text{erfi}(az)\,a^4+2(b-ic)e^{(b-ic)z}\left((-2bz+2ciz+4)a^2+(b-ic)^2\right)a-\left(8a^4+2(b-ic)^2a^2+(b-ic)^4\right)e^{-\frac{(b-ic)^2}{4a^2}-a^2z^2}\sqrt{\pi}\,\text{erfi}\left(\frac{b-ic}{2a}+az\right)\right)\right)\right)$$

06.28.21.0067.01

$$\int z^3 e^{b z} \cos(c z) \operatorname{erfi}(a z) \, dz = -\frac{1}{16 a^6 \sqrt{\pi}} e^{a^2 z^2} \left(\frac{1}{(b + c i)^4} \left(-8 e^{z(-z a^2 + b + c i)} \sqrt{\pi} \left((b + c i)^3 z^3 - 3 (b + c i)^2 z^2 + 6 (b + c i) z - 6 \right) \operatorname{erfi}(a z) a^6 + 2 (b + c i) e^{(b + c i) z} \left(4 \left((b + c i)^2 z^2 - 3 (b + c i) z + 6 \right) a^4 - 2 (b + c i)^2 (b z + c i z - 1) a^2 + (b + c i)^4 \right) a - \left(48 a^6 + 12 (b + c i)^2 a^4 + (b + c i)^6 \right) e^{-\frac{(b + c i)^2}{4 a^2} - a^2 z^2} \sqrt{\pi} \operatorname{erfi}\left(\frac{b + c i}{2 a} + a z \right) \right) + \frac{1}{(b - i c)^4} \left(-8 e^{z(-z a^2 + b - i c)} \sqrt{\pi} \left((b - i c)^3 z^3 - 3 (b - i c)^2 z^2 + 6 (b - i c) z - 6 \right) \operatorname{erfi}(a z) a^6 + 2 (b - i c) e^{(b - i c) z} \left(4 \left((b - i c)^2 z^2 - 3 (b - i c) z + 6 \right) a^4 - 2 (b - i c)^2 (b z - i c z - 1) a^2 + (b - i c)^4 \right) a - \left(48 a^6 + 12 (b - i c)^2 a^4 + (b - i c)^6 \right) e^{-\frac{(b - i c)^2}{4 a^2} - a^2 z^2} \sqrt{\pi} \operatorname{erfi}\left(\frac{b - i c}{2 a} + a z \right) \right) \right)$$

06.28.21.0068.01

$$\int z^{\alpha - 1} e^{b z^2} \cos(c z^2) \operatorname{erfi}(a z) \, dz = -\frac{1}{2 \sqrt{\pi}} a z^{\alpha + 1} \left(\sum_{k=0}^{\infty} \frac{(-b - c i)^{-k} a^{2 k} \Gamma\left(\frac{\alpha + 1}{2} + k, -(b + c i) z^2 \right)}{(2 k + 1) k!} \left(-(b + c i) z^2 \right)^{\frac{1}{2} (-\alpha - 1)} + \left(-(b - i c) z^2 \right)^{\frac{1}{2} (-\alpha - 1)} \sum_{k=0}^{\infty} \frac{(-b + i c)^{-k} a^{2 k} \Gamma\left(\frac{\alpha + 1}{2} + k, -(b - i c) z^2 \right)}{(2 k + 1) k!} \right)$$

06.28.21.0069.01

$$\int z e^{b z^2} \cos(c z^2) \operatorname{erfi}(a z) \, dz = \left(-a (b - i c) \sqrt{-(a^2 + b - i c) z^2} \operatorname{erf}\left(\sqrt{-(a^2 + b + c i) z^2} \right) z - a (b + c i) \sqrt{-(a^2 + b + c i) z^2} \operatorname{erf}\left(\sqrt{-(a^2 + b - i c) z^2} \right) z + a b \sqrt{-(a^2 + b + c i) z^2} z + a c i \sqrt{-(a^2 + b + c i) z^2} z + a b \sqrt{-(a^2 + b - i c) z^2} z - i a c \sqrt{-(a^2 + b - i c) z^2} z + 2 b e^{b z^2} \sqrt{-(a^2 + b + c i) z^2} \sqrt{-(a^2 + b - i c) z^2} \cos(c z^2) \operatorname{erfi}(a z) + 2 c e^{b z^2} \sqrt{-(a^2 + b + c i) z^2} \sqrt{-(a^2 + b - i c) z^2} \operatorname{erfi}(a z) \sin(c z^2) \right) \Big/ \left(4 (b^2 + c^2) \sqrt{-(a^2 + b - i c) z^2} \sqrt{-(a^2 + b + c i) z^2} \right)$$

06.28.21.0070.01

$$\int \frac{e^{b z^2} \cos(c z^2) \operatorname{erfi}(a z)}{z} \, dz = -\frac{a z}{2 \sqrt{\pi}} \left(\frac{1}{\sqrt{-(b - i c) z^2}} \sum_{k=0}^{\infty} \frac{(-b + i c)^{-k} a^{2 k} \Gamma\left(k + \frac{1}{2}, -(b - i c) z^2 \right)}{(2 k + 1) k!} + \frac{1}{\sqrt{-(b + c i) z^2}} \sum_{k=0}^{\infty} \frac{(-b - c i)^{-k} a^{2 k} \Gamma\left(k + \frac{1}{2}, -(b + c i) z^2 \right)}{(2 k + 1) k!} \right)$$

Involving hyperbolic functions

Involving sinh

06.28.21.0071.01

$$\int \sinh(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{1}{2\,b}\left(2\cosh(b\,z)\,\text{erfi}(a\,z) + e^{-\frac{b^2}{4a^2}}\left(\text{erfi}\left(\frac{b}{2\,a} - a\,z\right) - \text{erfi}\left(\frac{b}{2\,a} + a\,z\right)\right)\right)$$

06.28.21.0072.01

$$\int \sinh\left(b\,z^2\right)\text{erfi}(a\,z)\,dz = \frac{1}{2\sqrt{\pi}\,b}\left(\sum_{k=0}^{\infty}\frac{b^{-k}\,a^{2k+1}\,\Gamma\left(k+1,\,b\,z^2\right)}{(2\,k+1)\,k!} + \sum_{k=0}^{\infty}\frac{(-b)^{-k}\,a^{2k+1}\,\Gamma\left(k+1,\,-b\,z^2\right)}{(2\,k+1)\,k!}\right)$$

Involving cosh

06.28.21.0073.01

$$\int \cosh(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{1}{2\,b}\left(2\,\text{erfi}(a\,z)\sinh(b\,z) - e^{-\frac{b^2}{4a^2}}\left(\text{erfi}\left(\frac{b}{2\,a} + a\,z\right) + \text{erfi}\left(\frac{b}{2\,a} - a\,z\right)\right)\right)$$

06.28.21.0074.01

$$\int \cosh\left(b\,z^2\right)\text{erfi}(a\,z)\,dz = \frac{1}{2\sqrt{\pi}\,b}\left(\sum_{k=0}^{\infty}\frac{(-b)^{-k}\,a^{2k+1}\,\Gamma\left(k+1,\,-b\,z^2\right)}{(2\,k+1)\,k!} - \sum_{k=0}^{\infty}\frac{b^{-k}\,a^{2k+1}\,\Gamma\left(k+1,\,b\,z^2\right)}{(2\,k+1)\,k!}\right)$$

Involving hyperbolic functions and a power function

Involving sinh and power

06.28.21.0075.01

$$\int z^{\alpha-1}\sinh(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{a\,z^{\alpha}}{b\sqrt{\pi}}\sum_{k=0}^{\infty}\frac{a^{2k}\,b^{-2k}}{(2\,k+1)\,k!}\left((b\,z)^{-\alpha}\,\Gamma(2\,k+\alpha+1,\,b\,z) + (-b\,z)^{-\alpha}\,\Gamma(2\,k+\alpha+1,\,-b\,z)\right)$$

06.28.21.0076.01

$$\int z^n\sinh(b\,z)\,\text{erfi}(a\,z)\,dz =$$

$$\frac{(-1)^{n-1}\,b^{-2n}}{2\,b\sqrt{\pi}}\exp\left(-\frac{b^2}{4\,a^2}\right)\left(-a\,n!\,b^n\sum_{m=0}^{n}\frac{1}{m!}\,(-b)^m\left(a^2\right)^{\frac{1}{2}(-m-1)}\sum_{k=0}^{m}\binom{m}{k}\left(-\frac{b}{2\sqrt{a^2}}\right)^{m-k}\left(\sqrt{a^2}\,z + \frac{b}{2\sqrt{a^2}}\right)^{k+1}\right.$$

$$\left(-\left(\sqrt{a^2}\,z + \frac{b}{2\sqrt{a^2}}\right)^2\right)^{\frac{1}{2}(-k-1)}\Gamma\left(\frac{k+1}{2},\,-\left(\sqrt{a^2}\,z + \frac{b}{2\sqrt{a^2}}\right)^2\right) + -(-b)^n\exp\left(\frac{b^2}{4\,a^2}\right)\sqrt{\pi}$$

$$\text{erfi}(a\,z)\left(\Gamma(n+1,\,b\,z) + (-1)^n\,\Gamma(n+1,\,-b\,z)\right) - a\,(-b)^n\,n!\sum_{m=0}^{n}\frac{1}{m!}\,b^m\left(a^2\right)^{\frac{1}{2}(-m-1)}\sum_{k=0}^{m}\binom{m}{k}\left(\frac{b}{2\sqrt{a^2}}\right)^{m-k}$$

$$\left.\left(\sqrt{a^2}\,z - \frac{b}{2\sqrt{a^2}}\right)^{k+1}\left(-\left(\sqrt{a^2}\,z - \frac{b}{2\sqrt{a^2}}\right)^2\right)^{\frac{1}{2}(-k-1)}\Gamma\left(\frac{k+1}{2},\,-\left(\sqrt{a^2}\,z - \frac{b}{2\sqrt{a^2}}\right)^2\right)\right)\,/;\,n\in\mathbb{N}$$

06.28.21.0077.01

$$\int z\sinh(b\,z)\operatorname{erfi}(a\,z)\,dz = \frac{1}{4\,a^2\,b^2\,\sqrt{\pi}}\left(e^{-\frac{b^2}{4a^2}-z\,b}\left(2\,e^{\frac{b^2}{4a^2}}\sqrt{\pi}\left(b\,z+e^{2\,b\,z}(b\,z-1)+1\right)\operatorname{erfi}(a\,z)\,a^2+2\,e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}+a\,z\right)a^2-2\,b\,e^{\frac{b^2}{4a^2}+a^2z^2}\,a-2\,b\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,a+b^2\,e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}+a\,z\right)+\left(2\,a^2+b^2\right)e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}-a\,z\right)\right)\right)$$

06.28.21.0078.01

$$\int z^2\sinh(b\,z)\operatorname{erfi}(a\,z)\,dz = \frac{1}{8\,a^4\,b^3\,\sqrt{\pi}}\left(e^{-\frac{b^2}{4a^2}-z\,b}\left(4\,e^{\frac{b^2}{4a^2}}\sqrt{\pi}\left(b^2z^2+2\,b\,z+e^{2\,b\,z}\left(b^2z^2-2\,b\,z+2\right)+2\right)\operatorname{erfi}(a\,z)\,a^4-8\,e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}+a\,z\right)a^4-8\,b\,e^{\frac{b^2}{4a^2}+a^2z^2}\,a^3+8\,b\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,a^3-4\,b^2\,e^{\frac{b^2}{4a^2}+a^2z^2}\,z\,a^3-4\,b^2\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,z\,a^3-2\,b^2\,e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}+a\,z\right)a^2-2\,b^3\,e^{\frac{b^2}{4a^2}+a^2z^2}\,a+2\,b^3\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,a-b^4\,e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}+a\,z\right)+\left(8\,a^4+2\,b^2a^2+b^4\right)e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}-a\,z\right)\right)\right)$$

06.28.21.0079.01

$$\int z^3\sinh(b\,z)\operatorname{erfi}(a\,z)\,dz = \frac{1}{16\,a^6\,b^4\,\sqrt{\pi}}\left(e^{-\frac{b^2}{4a^2}-z\,b}\left(8\,e^{\frac{b^2}{4a^2}}\sqrt{\pi}\left(b^3z^3+3\,b^2z^2+6\,b\,z+e^{2\,b\,z}\left(b^3z^3-3\,b^2z^2+6\,b\,z-6\right)+6\right)\operatorname{erfi}(a\,z)\,a^6+48\,e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}+a\,z\right)a^6-48\,b\,e^{\frac{b^2}{4a^2}+a^2z^2}\,a^5-48\,b\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,a^5-8\,b^3\,e^{\frac{b^2}{4a^2}+a^2z^2}\,z^2\,a^5-8\,b^3\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,z^2\,a^5-24\,b^2\,e^{\frac{b^2}{4a^2}+a^2z^2}\,z\,a^5+24\,b^2\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,z\,a^5+12\,b^2\,e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}+a\,z\right)a^4-4\,b^3\,e^{\frac{b^2}{4a^2}+a^2z^2}\,a^3-4\,b^3\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,a^3-4\,b^4\,e^{\frac{b^2}{4a^2}+a^2z^2}\,z\,a^3+4\,b^4\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,z\,a^3-2\,b^5\,e^{\frac{b^2}{4a^2}+a^2z^2}\,a-2\,b^5\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2z^2}\,a+b^6\,e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}+a\,z\right)+\left(48\,a^6+12\,b^2a^4+b^6\right)e^{b\,z}\sqrt{\pi}\operatorname{erfi}\left(\frac{b}{2\,a}-a\,z\right)\right)\right)$$

06.28.21.0080.01

$$\int z^{\alpha-1}\sinh\left(b\,z^2\right)\operatorname{erfi}(a\,z)\,dz = \frac{a\,z^{\alpha+1}}{2\sqrt{\pi}}\left(-b^2z^4\right)^{\frac{1}{2}(-\alpha-1)}\left(\left(-b\,z^2\right)^{\frac{\alpha+1}{2}}\sum_{k=0}^{\infty}\frac{b^{-k}\,a^{2k}\,\Gamma\left(\frac{\alpha+1}{2}+k,\,b\,z^2\right)}{(2\,k+1)\,k!}-\left(b\,z^2\right)^{\frac{\alpha+1}{2}}\sum_{k=0}^{\infty}\frac{(-b)^{-k}\,a^{2k}\,\Gamma\left(\frac{\alpha+1}{2}+k,\,-b\,z^2\right)}{(2\,k+1)\,k!}\right)$$

06.28.21.0081.01

$$\int z\sinh(b z^2)\operatorname{erfi}(c+a z)\,dz = \frac{\cosh(b z^2)\operatorname{erfi}(c+a z)}{2b} - \left(a e^{c^2}\left(\sqrt{a^2-b}\; e^{-\frac{a^2c^2}{a^2-b}}\operatorname{erfi}\left(\frac{z a^2+c a-b z}{\sqrt{a^2-b}}\right)a^2+\sqrt{a^2+b}\; e^{-\frac{a^2c^2}{a^2+b}}\operatorname{erfi}\left(\frac{z a^2+c a+b z}{\sqrt{a^2+b}}\right)a^2+\sqrt{a^2-b}\; b\, e^{-\frac{a^2c^2}{a^2-b}}\operatorname{erfi}\left(\frac{z a^2+c a-b z}{\sqrt{a^2-b}}\right)-b\sqrt{a^2+b}\; e^{-\frac{a^2c^2}{a^2+b}}\operatorname{erfi}\left(\frac{z a^2+c a+b z}{\sqrt{a^2+b}}\right)\right)\right)\Big/\left(4\left(a^2-b\right)b\left(a^2+b\right)\right)$$

06.28.21.0082.01

$$\int z\sinh(b z^2)\operatorname{erfi}(a z)\,dz = \frac{1}{4b(b^2-a^4)}\left(a\left(\sqrt{a^2-b}\;(a^2+b)\operatorname{erfi}\left(\sqrt{a^2-b}\;z\right)+(a^2-b)\sqrt{a^2+b}\;\operatorname{erfi}\left(\sqrt{a^2+b}\;z\right)\right)-2\left(a^4-b^2\right)\cosh(b z^2)\operatorname{erfi}(a z)\right)$$

06.28.21.0083.01

$$\int z^3\sinh(b z^2)\operatorname{erfi}(a z)\,dz = -\frac{1}{4b^2}\left(\frac{1}{\sqrt{\pi}}\left(a b z^3\left(\left(\frac{1}{2}\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{-(a^2-b)z^2}\right)-1\right)-e^{(a^2-b)z^2}\sqrt{-(a^2-b)z^2}\right)\Big/\left(-(a^2-b)z^2\right)^{3/2}+\left(\frac{1}{2}\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{-(a^2+b)z^2}\right)-1\right)-e^{(a^2+b)z^2}\sqrt{-(a^2+b)z^2}\right)\Big/\left(-(a^2+b)z^2\right)^{3/2}\right)\right)+\frac{1}{a^4-b^2}\left(a\left(\sqrt{a^2-b}\;(a^2+b)\operatorname{erfi}\left(\sqrt{a^2-b}\;z\right)+(b-a^2)\sqrt{a^2+b}\;\operatorname{erfi}\left(\sqrt{a^2+b}\;z\right)\right)\right)-2\operatorname{erfi}(a z)\left(b z^2\cosh(b z^2)-\sinh(b z^2)\right)\right)$$

06.28.21.0084.01

$$\int\frac{\sinh(b z^2)\operatorname{erfi}(a z)}{z}\,dz = \frac{a z}{2\sqrt{\pi b z^2}}\sum_{k=0}^{\infty}\frac{b^{-k}a^{2k}\,\Gamma\left(k+\frac{1}{2},\,b z^2\right)}{(2k+1)\,k!}-\frac{a z}{2\sqrt{-\pi b z^2}}\sum_{k=0}^{\infty}\frac{(-b)^{-k}\,a^{2k}\,\Gamma\left(k+\frac{1}{2},\,-b z^2\right)}{(2k+1)\,k!}$$

Involving cosh and power

06.28.21.0085.01

$$\int z^{\alpha-1}\cosh(b z)\operatorname{erfi}(a z)\,dz = \frac{a z^{\alpha}}{b\sqrt{\pi}}\sum_{k=0}^{\infty}\frac{a^{2k}b^{-2k}}{(2k+1)\,k!}\left((-b z)^{-\alpha}\,\Gamma(2k+\alpha+1,\,-b z)-(b z)^{-\alpha}\,\Gamma(2k+\alpha+1,\,b z)\right)$$

06.28.21.0086.01

$$\int z^n \cosh(b\,z)\,\mathrm{erfi}(a\,z)\,dz = \frac{(-1)^n b^{-2n}}{2\,b\sqrt{\pi}} \exp\left(-\frac{b^2}{4\,a^2}\right)\left(a\,n!\,b^n \sum_{m=0}^{n} \frac{(-b)^m (a^2)^{\frac{1}{2}(-m-1)}}{m!} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{b}{2\sqrt{a^2}}\right)^{m-k} \left(\sqrt{a^2}\,z + \frac{b}{2\sqrt{a^2}}\right)^{k+1} \left(-\left(\sqrt{a^2}\,z + \frac{b}{2\sqrt{a^2}}\right)^2\right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\sqrt{a^2}\,z + \frac{b}{2\sqrt{-a^2}}\right)^2\right) - a\,n!\,(-b)^n \sum_{m=0}^{n} \frac{b^m (a^2)^{\frac{1}{2}(-m-1)}}{m!} \sum_{k=0}^{m} \binom{m}{k} \left(\frac{b}{2\sqrt{a^2}}\right)^{m-k} \left(\sqrt{a^2}\,z - \frac{b}{2\sqrt{a^2}}\right)^{k+1} \left(-\left(\sqrt{a^2}\,z - \frac{b}{2\sqrt{a^2}}\right)^2\right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\sqrt{a^2}\,z - \frac{b}{2\sqrt{a^2}}\right)^2\right)\right) - \sqrt{\pi}\,(-b)^n e^{\frac{b^2}{4a^2}}\,\mathrm{erfi}(a\,z)\,(\Gamma(n+1, b\,z) - (-1)^n\,\Gamma(n+1, -b\,z)) \;/;\; n \in \mathbb{N}$$

06.28.21.0087.01

$$\int z \cosh(b\,z)\,\mathrm{erfi}(a\,z)\,dz = \frac{1}{4\,a^2\,b^2\sqrt{\pi}}\left(e^{-\frac{b^2}{4a^2}-z\,b}\left(-2\,e^{\frac{b^2}{4a^2}}\sqrt{\pi}\left(b\,z + e^{2\,b\,z}(1-b\,z)+1\right)\mathrm{erfi}(a\,z)\,a^2 + 2\,e^{b\,z}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b}{2\,a}+a\,z\right)a^2 + 2\,b\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,a - 2\,b\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,a + b^2\,e^{b\,z}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b}{2\,a}+a\,z\right) - \left(2\,a^2+b^2\right)e^{b\,z}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b}{2\,a}-a\,z\right)\right)\right)$$

06.28.21.0088.01

$$\int z^2 \cosh(b\,z)\,\mathrm{erfi}(a\,z)\,dz = \frac{1}{8\,a^4\,b^3\sqrt{\pi}}\,e^{-\frac{b^2}{4a^2}-z\,b}\left(-8\,e^{b\,z}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b}{2\,a}+a\,z\right)a^4 - 8\,e^{\frac{b^2}{4a^2}}\sqrt{\pi}\,\mathrm{erfi}(a\,z)\left(-b^2\,e^{b\,z}\sinh(b\,z)\,z^2 + b\,z + e^{2\,b\,z}(b\,z-1)+1\right)a^4 + 8\,b\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,a^3 + 8\,b\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,a^3 + 4\,b^2\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,z\,a^3 - 4\,b^2\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,z\,a^3 - 2\,b^2\,e^{b\,z}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b}{2\,a}+a\,z\right)a^2 + 2\,b^3\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,a + 2\,b^3\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,a - b^4\,e^{b\,z}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b}{2\,a}+a\,z\right) - \left(8\,a^4+2\,b^2\,a^2+b^4\right)e^{b\,z}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b}{2\,a}-a\,z\right)\right)$$

06.28.21.0089.01

$$\int z^3 \cosh(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{1}{16\,a^6\,b^4\,\sqrt{\pi}}\,e^{-\frac{b^2}{4a^2}-z\,b}\Big(-8\,e^{\frac{b^2}{4a^2}}\sqrt{\pi}\,\big(b^3 z^3+3\,b^2 z^2+6\,b\,z+e^{2\,b\,z}\big(-b^3 z^3+3\,b^2 z^2-6\,b\,z+6\big)+6\big)\,\text{erfi}(a\,z)\,a^6 + 48\,e^{b\,z}\sqrt{\pi}\,\text{erfi}\Big(\frac{b}{2\,a}+a\,z\Big)a^6+48\,b\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,a^5-48\,b\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,a^5+8\,b^3\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,z^2\,a^5 - 8\,b^3\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,z^2\,a^5+24\,b^2\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,z\,a^5+24\,b^2\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,z\,a^5+12\,b^2\,e^{b\,z}\sqrt{\pi}\,\text{erfi}\Big(\frac{b}{2\,a}+a\,z\Big)a^4 + 4\,b^3\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,a^3-4\,b^3\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,a^3+4\,b^4\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,z\,a^3+4\,b^4\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,z\,a^3+2\,b^5\,e^{\frac{b^2}{4a^2}+a^2 z^2}\,a - 2\,b^5\,e^{\frac{b^2}{4a^2}+2\,z\,b+a^2 z^2}\,a+b^6\,e^{b\,z}\sqrt{\pi}\,\text{erfi}\Big(\frac{b}{2\,a}+a\,z\Big)-\big(48\,a^6+12\,b^2 a^4+b^6\big)\,e^{b\,z}\sqrt{\pi}\,\text{erfi}\Big(\frac{b}{2\,a}-a\,z\Big)\Big)$$

06.28.21.0090.01

$$\int z^{\alpha-1}\cosh\big(b\,z^2\big)\,\text{erfi}(a\,z)\,dz = \frac{a\,z^{\alpha+1}}{2\sqrt{\pi}}\big(-b^2 z^4\big)^{\frac{1}{2}(-\alpha-1)}\left(-\big(-b\,z^2\big)^{\frac{\alpha+1}{2}}\sum_{k=0}^{\infty}\frac{b^{-k}\,a^{2k}\,\Gamma\big(\frac{\alpha+1}{2}+k,\,b\,z^2\big)}{(2\,k+1)\,k!}-\big(b\,z^2\big)^{\frac{\alpha+1}{2}}\sum_{k=0}^{\infty}\frac{(-b)^{-k}\,a^{2k}\,\Gamma\big(\frac{\alpha+1}{2}+k,\,-b\,z^2\big)}{(2\,k+1)\,k!}\right)$$

06.28.21.0091.01

$$\int z\cosh\big(b\,z^2\big)\,\text{erfi}(c+a\,z)\,dz = \frac{1}{4\,\big(b^3-a^4 b\big)}\exp\Big(-\frac{a^2 c^2}{a^2+b}\Big)\left(a\sqrt{b-a^2}\,\big(a^2+b\big)\exp\Big(\frac{\big(a^4-2\,b\,a^2-b^2\big)c^2}{a^4-b^2}\Big)\text{erf}\Big(\frac{-z\,a^2-a\,c+b\,z}{\sqrt{b-a^2}}\Big)+\big(a^2-b\big)\Big(a\sqrt{a^2+b}\;e^{c^2}\,\text{erfi}\Big(\frac{z\,a^2+c\,a+b\,z}{\sqrt{a^2+b}}\Big)-2\,\big(a^2+b\big)\,e^{\frac{a^2 c^2}{a^2+b}}\,\text{erfi}(c+a\,z)\sinh\big(b\,z^2\big)\Big)\right)$$

06.28.21.0092.01

$$\int z\cosh\big(b\,z^2\big)\,\text{erfi}(a\,z)\,dz = \frac{1}{4\,\big(b^3-a^4 b\big)}\Big(a\sqrt{b-a^2}\,\big(a^2+b\big)\,\text{erf}\big(\sqrt{b-a^2}\;z\big)+\big(a^2-b\big)\Big(a\sqrt{a^2+b}\;\text{erfi}\big(\sqrt{a^2+b}\;z\big)-2\,\big(a^2+b\big)\,\text{erfi}(a\,z)\sinh\big(b\,z^2\big)\Big)\Big)$$

06.28.21.0093.01

$$\int z^3 \cosh(b z^2) \operatorname{erfi}(a z) \, dz = -\frac{1}{4 b^2} \left(\frac{1}{\sqrt{\pi}} \left(a b z^3 \left(\left(e^{(a^2-b) z^2} \sqrt{-(a^2-b) z^2} - \frac{1}{2} \sqrt{\pi} \left(\operatorname{erf}\left(\sqrt{-(a^2-b) z^2} \right) - 1 \right) \right) \Big/ \left(-(a^2-b) z^2 \right)^{3/2} + \left(\frac{1}{2} \sqrt{\pi} \left(\operatorname{erf}\left(\sqrt{-(a^2+b) z^2} \right) - 1 \right) - e^{(a^2+b) z^2} \sqrt{-(a^2+b) z^2} \right) \Big/ \left(-(a^2+b) z^2 \right)^{3/2} \right) + \frac{1}{a^4 - b^2} \left(a \left(\sqrt{b-a^2} \, (a^2+b) \operatorname{erf}\left(\sqrt{b-a^2} \, z \right) + (b-a^2) \sqrt{a^2+b} \operatorname{erfi}\left(\sqrt{a^2+b} \, z \right) \right) \right) \right) + 2 \operatorname{erfi}(a z) \left(\cosh(b z^2) - b z^2 \sinh(b z^2) \right) \right)$$

06.28.21.0094.01

$$\int \frac{\cosh(b z^2) \operatorname{erfi}(a z)}{z} \, dz = -\frac{a z}{2 \sqrt{\pi b z^2}} \sum_{k=0}^{\infty} \frac{b^{-k} a^{2k} \Gamma\left(k + \frac{1}{2}, b z^2\right)}{(2k+1) k!} - \frac{a z}{2 \sqrt{-\pi b z^2}} \sum_{k=0}^{\infty} \frac{(-b)^{-k} a^{2k} \Gamma\left(k + \frac{1}{2}, -b z^2\right)}{(2k+1) k!}$$

Involving exponential function and hyperbolic functions

Involving exp and sinh

06.28.21.0095.01

$$\int e^{b z} \sinh(c z) \operatorname{erfi}(a z) \, dz = \frac{1}{2 (b^2 - c^2)} \exp\left(-\frac{b^2 + c^2}{2 a^2} \right) \left(\exp\left(\frac{(b-c)^2}{4 a^2} \right) \left((b+c) e^{\frac{b c}{a^2}} \operatorname{erfi}\left(\frac{2 z a^2 + b - c}{2 a} \right) + (c - b) \operatorname{erfi}\left(\frac{2 z a^2 + b + c}{2 a} \right) \right) + 2 \exp\left(\frac{2 b z a^2 + b^2 + c^2}{2 a^2} \right) \operatorname{erfi}(a z) (b \sinh(c z) - c \cosh(c z)) \right)$$

06.28.21.0096.01

$$\int e^{b z^2} \sinh(c z^2) \operatorname{erfi}(a z) \, dz = \frac{1}{2 \sqrt{\pi} \, (b + c)} \sum_{k=0}^{\infty} \frac{(-b-c)^{-k} a^{2k+1} \Gamma\left(k+1, -(b+c) z^2\right)}{(2k+1) k!} - \frac{1}{2 \sqrt{\pi} \, (b - c)} \sum_{k=0}^{\infty} \frac{(c-b)^{-k} a^{2k+1} \Gamma\left(k+1, -(b-c) z^2\right)}{(2k+1) k!}$$

Involving exp and cosh

06.28.21.0097.01

$$\int e^{b z} \cosh(c z) \operatorname{erfi}(a z) \, dz = \frac{1}{2 (b^2 - c^2)} \left(\exp\left(-\frac{b^2 + c^2}{2 a^2} \right) \left(2 \exp\left(\frac{2 b z a^2 + b^2 + c^2}{2 a^2} \right) \operatorname{erfi}(a z) (b \cosh(c z) - c \sinh(c z)) - e^{\frac{(b-c)^2}{4 a^2}} \left((b+c) e^{\frac{b c}{a^2}} \operatorname{erfi}\left(\frac{2 z a^2 + b - c}{2 a} \right) + (b - c) \operatorname{erfi}\left(\frac{2 z a^2 + b + c}{2 a} \right) \right) \right) \right)$$

06.28.21.0098.01

$$\int e^{b z^2} \cosh\left(c z^2\right) \operatorname{erfi}(a z)\, dz = \frac{1}{2\sqrt{\pi}\,(b-c)} \sum_{k=0}^{\infty} \frac{(c-b)^{-k} a^{2k+1} \Gamma\left(k+1, -(b-c) z^2\right)}{(2k+1)\, k!} + \frac{1}{2\sqrt{\pi}\,(b+c)} \sum_{k=0}^{\infty} \frac{(-b-c)^{-k} a^{2k+1} \Gamma\left(k+1, -(b+c) z^2\right)}{(2k+1)\, k!}$$

Involving power, exponential and hyperbolic functions

Involving power, exp and sinh

06.28.21.0099.01

$$\int z^{\alpha-1} e^{b z} \sinh(c z) \operatorname{erfi}(a z)\, dz = \frac{a z^{\alpha} (-(b+c) z)^{-\alpha}}{(b+c)\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{a^{2k} (b+c)^{-2k}}{(2k+1)\, k!} \Gamma(2k+\alpha+1, -(b+c) z) - \frac{a z^{\alpha} (-(b-c) z)^{-\alpha}}{(b-c)\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{a^{2k} (b-c)^{-2k}}{(2k+1)\, k!} \Gamma(2k+\alpha+1, -(b-c) z)$$

06.28.21.0100.01

$$\int z^{n} e^{b z} \sinh(c z) \operatorname{erfi}(a z)\, dz = -\frac{1}{2} (-c-b)^{-n-1} \operatorname{erfi}(a z)\, \Gamma(n+1, (-c-b) z) + \frac{1}{2} (-b+c)^{-n-1} \operatorname{erfi}(a z)\, \Gamma(n+1, (-b+c) z) + \frac{1}{2\sqrt{\pi}} \left(a (-b+c)^{-n-1} e^{-\frac{(b-c)^2}{4a^2}} n! \sum_{m=0}^{n} \frac{1}{m!} \left((-(b-c))^m \left(a^2\right)^{\frac{1}{2}(-m-1)} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{b-c}{2\sqrt{a^2}} \right)^{m-k} \left(\frac{b-c}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^{k+1} \left(-\left(\frac{b-c}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^2 \right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\frac{b-c}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^2 \right) \right) \right) - \frac{1}{2\sqrt{\pi}} \left(a (-c-b)^{-n-1} e^{-\frac{(b+c)^2}{4a^2}} n! \sum_{m=0}^{n} \frac{1}{m!} \left((-(b+c))^m \left(a^2\right)^{\frac{1}{2}(-m-1)} \sum_{k=0}^{m} \binom{m}{k} \left(-\frac{b+c}{2\sqrt{a^2}} \right)^{m-k} \left(\frac{b+c}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^{k+1} \left(-\left(\frac{b+c}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^2 \right)^{\frac{1}{2}(-k-1)} \Gamma\left(\frac{k+1}{2}, -\left(\frac{b+c}{2\sqrt{a^2}} + \sqrt{a^2}\, z \right)^2 \right) \right) \right) /; n \in \mathbb{N}$$

06.28.21.0101.01

$$\int z\,e^{b z}\sinh(c z)\operatorname{erfi}(a z)\,dz = \frac{i}{4 a^2\sqrt{\pi}}\,e^{a^2 z^2}\left(\frac{1}{(b+c)^2}\left(i\left(-2\,e^{z\left(-z a^2+b+c\right)}\sqrt{\pi}\,(b z+c z-1)\operatorname{erfi}(a z)\,a^2+2\,(b+c)\,e^{(b+c) z}\,a-\left(2 a^2+(b+c)^2\right) e^{-\frac{(b+c)^2}{4 a^2}-a^2 z^2}\sqrt{\pi}\operatorname{erfi}\left(\frac{b+c}{2 a}+a z\right)\right)\right)-\frac{1}{(b-c)^2}\left(i\left(-2\,e^{-z\left(z a^2-b+c\right)}\sqrt{\pi}\,(b z-c z-1)\operatorname{erfi}(a z)\,a^2+2\,(b-c)\,e^{(b-c) z}\,a-\left(2 a^2+(b-c)^2\right) e^{-\frac{(b-c)^2}{4 a^2}-a^2 z^2}\sqrt{\pi}\operatorname{erfi}\left(\frac{b-c}{2 a}+a z\right)\right)\right)\right)$$

06.28.21.0102.01

$$\int z^2\,e^{b z}\sinh(c z)\operatorname{erfi}(a z)\,dz = \frac{1}{8 a^4\sqrt{\pi}}\,e^{a^2 z^2}\left(\frac{1}{(b+c)^3}\left(4\,e^{z\left(-z a^2+b+c\right)}\sqrt{\pi}\left((b+c)^2 z^2-2\,(b+c)\,z+2\right)\operatorname{erfi}(a z)\,a^4+2\,(b+c)\,e^{(b+c) z}\left((b+c)^2-2 a^2\,(b z+c z-2)\right) a-\left(8 a^4+2\,(b+c)^2 a^2+(b+c)^4\right) e^{-\frac{(b+c)^2}{4 a^2}-a^2 z^2}\sqrt{\pi}\operatorname{erfi}\left(\frac{b+c}{2 a}+a z\right)\right)-\frac{1}{(b-c)^3}\left(4\,e^{-z\left(z a^2-b+c\right)}\sqrt{\pi}\left((b-c)^2 z^2-2\,(b-c)\,z+2\right)\operatorname{erfi}(a z)\,a^4+2\,(b-c)\,e^{(b-c) z}\left((-2 b z+2 c z+4)\,a^2+(b-c)^2\right) a-\left(8 a^4+2\,(b-c)^2 a^2+(b-c)^4\right) e^{-\frac{(b-c)^2}{4 a^2}-a^2 z^2}\sqrt{\pi}\operatorname{erfi}\left(\frac{b-c}{2 a}+a z\right)\right)\right)$$

06.28.21.0103.01

$$\int z^3\,e^{b z}\sinh(c z)\operatorname{erfi}(a z)\,dz = \frac{1}{16 a^6\sqrt{\pi}}\,e^{a^2 z^2}\left(\frac{1}{(b-c)^4}\left(-8\,e^{z\left(-z a^2+b-c\right)}\sqrt{\pi}\left((b-c)^3 z^3-3\,(b-c)^2 z^2+6\,(b-c)\,z-6\right)\operatorname{erfi}(a z)\,a^6+2\,(b-c)\,e^{(b-c) z}\left(4\left((b-c)^2 z^2-3\,(b-c)\,z+6\right) a^4-2\,(b-c)^2\,(b z-c z-1)\,a^2+(b-c)^4\right) a+\left(-48 a^6-12\,(b-c)^2 a^4-(b-c)^6\right) e^{-\frac{(b-c)^2}{4 a^2}-a^2 z^2}\sqrt{\pi}\operatorname{erfi}\left(\frac{b-c}{2 a}+a z\right)\right)-\frac{1}{(b+c)^4}\left(-8\,e^{z\left(-z a^2+b+c\right)}\sqrt{\pi}\left((b+c)^3 z^3-3\,(b+c)^2 z^2+6\,(b+c)\,z-6\right)\operatorname{erfi}(a z)\,a^6+2\,(b+c)\,e^{(b+c) z}\left(4\left((b+c)^2 z^2-3\,(b+c)\,z+6\right) a^4-2\,(b+c)^2\,(b z+c z-1)\,a^2+(b+c)^4\right) a+\left(-48 a^6-12\,(b+c)^2 a^4-(b+c)^6\right) e^{-\frac{(b+c)^2}{4 a^2}-a^2 z^2}\sqrt{\pi}\operatorname{erfi}\left(\frac{b+c}{2 a}+a z\right)\right)\right)$$

06.28.21.0104.01

$$\int z^{\alpha-1} e^{b z^2} \sinh(c z^2) \operatorname{erfi}(a z) \, dz = \frac{1}{2\sqrt{\pi}} a z^{\alpha+1} \left(\left(-(b-c) z^2\right)^{\frac{1}{2}(-\alpha-1)} \sum_{k=0}^{\infty} \frac{(c-b)^{-k} a^{2k} \Gamma\left(\frac{\alpha+1}{2}+k, -(b-c) z^2\right)}{(2k+1)\, k!} - \left(-(b+c) z^2\right)^{\frac{1}{2}(-\alpha-1)} \sum_{k=0}^{\infty} \frac{(-b-c)^{-k} a^{2k} \Gamma\left(\frac{\alpha+1}{2}+k, -(b+c) z^2\right)}{(2k+1)\, k!} \right)$$

06.28.21.0105.01

$$\int z e^{b z^2} \sinh(c z^2) \operatorname{erf}(a z) \, dz = \left(a (b+c) \sqrt{-\left(a^2+b+c\right) z^2} \operatorname{erf}\left(\sqrt{-\left(a^2+b-c\right) z^2}\right) z + a (c-b) \sqrt{-\left(a^2+b-c\right) z^2} \operatorname{erf}\left(\sqrt{-\left(a^2+b+c\right) z^2}\right) z + a b \sqrt{-\left(a^2+b-c\right) z^2}\, z - a c \sqrt{-\left(a^2+b-c\right) z^2}\, z - a b \sqrt{-\left(a^2+b+c\right) z^2}\, z - a c \sqrt{-\left(a^2+b+c\right) z^2}\, z - 2 c e^{b z^2} \sqrt{-\left(a^2+b-c\right) z^2} \sqrt{-\left(a^2+b+c\right) z^2} \cosh(c z^2) \operatorname{erfi}(a z) + 2 b e^{b z^2} \sqrt{-\left(a^2+b-c\right) z^2} \sqrt{-\left(a^2+b+c\right) z^2} \operatorname{erfi}(a z) \sinh(c z^2) \right) \Big/ \left(4 \left(b^2-c^2\right) \sqrt{-\left(a^2+b-c\right) z^2} \sqrt{-\left(a^2+b+c\right) z^2} \right)$$

06.28.21.0106.01

$$\int \frac{e^{b z^2} \sinh(c z^2) \operatorname{erfi}(a z)}{z} \, dz = -\frac{a z}{2\sqrt{\pi}} \left(\frac{1}{\sqrt{-(b+c) z^2}} \sum_{k=0}^{\infty} \frac{(-b-c)^{-k} a^{2k} \Gamma\left(k+\frac{1}{2}, -(b+c) z^2\right)}{(2k+1)\, k!} - \frac{1}{\sqrt{-(b-c) z^2}} \sum_{k=0}^{\infty} \frac{(c-b)^{-k} a^{2k} \Gamma\left(k+\frac{1}{2}, -(b-c) z^2\right)}{(2k+1)\, k!} \right)$$

Involving power, exp and cosh

06.28.21.0107.01

$$\int z^{\alpha-1} e^{b z} \cosh(c z) \operatorname{erfi}(a z) \, dz = \frac{a z^{\alpha} (-(b-c) z)^{-\alpha}}{(b-c)\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{a^{2k} (b-c)^{-2k}}{(2k+1)\, k!} \Gamma(2k+\alpha+1, -(b-c) z) + \frac{a z^{\alpha} (-(b+c) z)^{-\alpha}}{(b+c)\sqrt{\pi}} \sum_{k=0}^{\infty} \frac{a^{2k} (b+c)^{-2k}}{(2k+1)\, k!} \Gamma(2k+\alpha+1, -(b+c) z)$$

06.28.21.0108.01

$$\int z^n e^{bz}\cosh(cz)\,\mathrm{erfi}(az)\,dz = -\frac{1}{2}(-c-b)^{-n-1}\,\mathrm{erfi}(az)\,\Gamma(n+1,(-c-b)z) - \frac{1}{2}(-b+c)^{-n-1}\,\mathrm{erfi}(az)\,\Gamma(n+1,(-b+c)z) - \frac{1}{2\sqrt{\pi}}\left(a(-b+c)^{-n-1}e^{-\frac{(b-c)^2}{4a^2}}\,n!\sum_{m=0}^{n}\frac{1}{m!}\left((-(b-c))^m\left(a^2\right)^{\frac{1}{2}(-m-1)}\sum_{k=0}^{m}\binom{m}{k}\left(-\frac{b-c}{2\sqrt{a^2}}\right)^{m-k}\left(\frac{b-c}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^{k+1}\left(-\left(\frac{b-c}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^2\right)^{\frac{1}{2}(-k-1)}\Gamma\left(\frac{k+1}{2},-\left(\frac{b-c}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^2\right)\right)\right) - \frac{1}{2\sqrt{\pi}}\left(a(-c-b)^{-n-1}e^{-\frac{(b+c)^2}{4a^2}}\,n!\sum_{m=0}^{n}\frac{1}{m!}\left((-(b+c))^m\left(a^2\right)^{\frac{1}{2}(-m-1)}\sum_{k=0}^{m}\binom{m}{k}\left(-\frac{b+c}{2\sqrt{a^2}}\right)^{m-k}\left(\frac{b+c}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^{k+1}\left(-\left(\frac{b+c}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^2\right)^{\frac{1}{2}(-k-1)}\Gamma\left(\frac{k+1}{2},-\left(\frac{b+c}{2\sqrt{a^2}}+\sqrt{a^2}\,z\right)^2\right)\right)\right)\,/;\,n\in\mathbb{N}$$

06.28.21.0109.01

$$\int z\,e^{bz}\cosh(cz)\,\mathrm{erfi}(az)\,dz = -\frac{1}{4a^2\sqrt{\pi}}e^{a^2z^2}\left(\frac{1}{(b-c)^2}\left(-2e^{-z\left(za^2-b+c\right)}\sqrt{\pi}\,(bz-cz-1)\,\mathrm{erfi}(az)\,a^2+2(b-c)e^{(b-c)z}a-\left(2a^2+(b-c)^2\right)e^{-\frac{(b-c)^2}{4a^2}-a^2z^2}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b-c}{2a}+az\right)\right)+\frac{1}{(b+c)^2}\left(-2e^{z\left(-za^2+b+c\right)}\sqrt{\pi}\,(bz+cz-1)\,\mathrm{erfi}(az)\,a^2+2(b+c)e^{(b+c)z}a-\left(2a^2+(b+c)^2\right)e^{-\frac{(b+c)^2}{4a^2}-a^2z^2}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b+c}{2a}+az\right)\right)\right)$$

06.28.21.0110.01

$$\int z^2 e^{bz}\cosh(cz)\,\mathrm{erf}(az)\,dz = \frac{1}{8a^4\sqrt{\pi}}e^{a^2z^2}\left(\frac{1}{(b-c)^3}\left(4e^{-z\left(za^2-b+c\right)}\sqrt{\pi}\left((b-c)^2z^2-2(b-c)z+2\right)\mathrm{erfi}(az)\,a^4+2(b-c)e^{(b-c)z}\left((-2bz+2cz+4)a^2+(b-c)^2\right)a-\left(8a^4+2(b-c)^2a^2+(b-c)^4\right)e^{-\frac{(b-c)^2}{4a^2}-a^2z^2}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b-c}{2a}+az\right)\right)+\frac{1}{(b+c)^3}\left(4e^{z\left(-za^2+b+c\right)}\sqrt{\pi}\left((b+c)^2z^2-2(b+c)z+2\right)\mathrm{erfi}(az)\,a^4+2(b+c)e^{(b+c)z}\left((b+c)^2-2a^2(bz+cz-2)\right)a-\left(8a^4+2(b+c)^2a^2+(b+c)^4\right)e^{-\frac{(b+c)^2}{4a^2}-a^2z^2}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b+c}{2a}+az\right)\right)\right)$$

06.28.21.0111.01

$$\int z^3 e^{b z} \cosh(c z) \operatorname{erfi}(a z) \, dz = -\frac{1}{16 a^6 \sqrt{\pi}} e^{a^2 z^2} \left(\frac{1}{(b-c)^4} \left(-8 e^{-z (z a^2 - b + c)} \sqrt{\pi} \left((b-c)^3 z^3 - 3 (b-c)^2 z^2 + 6 (b-c) z - 6 \right) \operatorname{erfi}(a z) a^6 + 2 (b-c) e^{(b-c) z} \left(4 \left((b-c)^2 z^2 - 3 (b-c) z + 6 \right) a^4 - 2 (b-c)^2 (b z - c z - 1) a^2 + (b-c)^4 \right) a - \left(48 a^6 + 12 (b-c)^2 a^4 + (b-c)^6 \right) e^{-\frac{(b-c)^2}{4 a^2} - a^2 z^2} \sqrt{\pi} \operatorname{erfi}\left(\frac{b-c}{2 a} + a z \right) \right) + \frac{1}{(b+c)^4} \left(-8 e^{z (-z a^2 + b + c)} \sqrt{\pi} \left((b+c)^3 z^3 - 3 (b+c)^2 z^2 + 6 (b+c) z - 6 \right) \operatorname{erfi}(a z) a^6 + 2 (b+c) e^{(b+c) z} \left(4 \left((b+c)^2 z^2 - 3 (b+c) z + 6 \right) a^4 - 2 (b+c)^2 (b z + c z - 1) a^2 + (b+c)^4 \right) a - \left(48 a^6 + 12 (b+c)^2 a^4 + (b+c)^6 \right) e^{-\frac{(b+c)^2}{4 a^2} - a^2 z^2} \sqrt{\pi} \operatorname{erfi}\left(\frac{b+c}{2 a} + a z \right) \right) \right)$$

06.28.21.0112.01

$$\int z^{\alpha-1} e^{b z^2} \cosh(c z^2) \operatorname{erfi}(a z) \, dz = -\frac{1}{2 \sqrt{\pi}} a z^{\alpha+1} \left(\left(-(b-c) z^2 \right)^{\frac{1}{2}(-\alpha-1)} \sum_{k=0}^{\infty} \frac{(c-b)^{-k} a^{2k} \Gamma\left(\frac{\alpha+1}{2} + k, -(b-c) z^2 \right)}{(2k+1) k!} + \left(-(b+c) z^2 \right)^{\frac{1}{2}(-\alpha-1)} \sum_{k=0}^{\infty} \frac{(-b-c)^{-k} a^{2k} \Gamma\left(\frac{\alpha+1}{2} + k, -(b+c) z^2 \right)}{(2k+1) k!} \right)$$

06.28.21.0113.01

$$\int z e^{b z^2} \cosh(c z^2) \operatorname{erfi}(a z) \, dz = \left(-a (b+c) \sqrt{-(a^2+b+c) z^2} \operatorname{erf}\left(\sqrt{-(a^2+b-c) z^2} \right) z + a (c-b) \sqrt{-(a^2+b-c) z^2} \operatorname{erf}\left(\sqrt{-(a^2+b+c) z^2} \right) z + a b \sqrt{-(a^2+b-c) z^2} z - a c \sqrt{-(a^2+b-c) z^2} z + a b \sqrt{-(a^2+b+c) z^2} z + a c \sqrt{-(a^2+b+c) z^2} z + 2 b e^{b z^2} \sqrt{-(a^2+b-c) z^2} \sqrt{-(a^2+b+c) z^2} \cosh(c z^2) \operatorname{erfi}(a z) - 2 c e^{b z^2} \sqrt{-(a^2+b-c) z^2} \sqrt{-(a^2+b+c) z^2} \operatorname{erfi}(a z) \sinh(c z^2) \right) \Big/ \left(4 (b^2 - c^2) \sqrt{-(a^2+b-c) z^2} \sqrt{-(a^2+b+c) z^2} \right)$$

06.28.21.0114.01

$$\int \frac{e^{b z^2} \cosh(c z^2) \operatorname{erfi}(a z)}{z} \, dz = -\frac{a z}{2 \sqrt{\pi}} \left(\frac{1}{\sqrt{-(b+c) z^2}} \sum_{k=0}^{\infty} \frac{(-b-c)^{-k} a^{2k} \Gamma\left(k + \frac{1}{2}, -(b+c) z^2 \right)}{(2k+1) k!} + \frac{1}{\sqrt{-(b-c) z^2}} \sum_{k=0}^{\infty} \frac{(c-b)^{-k} a^{2k} \Gamma\left(k + \frac{1}{2}, -(b-c) z^2 \right)}{(2k+1) k!} \right)$$

Involving logarithm

Involving log

06.28.21.0115.01

$$\int \log(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{1}{2\,a\,\sqrt{\pi}}\left(\text{Ei}\left(a^2\,z^2\right) - 2\,e^{a^2\,z^2}\,(\log(b\,z)-1) + 2\,a\,\sqrt{\pi}\,z\,\text{erfi}(a\,z)\,(\log(b\,z)-1)\right)$$

Involving logarithm and a power function

Involving log and power

06.28.21.0116.01

$$\int z^{\alpha-1}\log(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{1}{\sqrt{\pi}\,\alpha^2\,(\alpha+1)^2}\left(z^\alpha\left(-a^2\,z^2\right)^{\frac{1}{2}(-\alpha-1)}\left(2\,a\,z\,\alpha\,{}_2F_2\left(\frac{\alpha}{2}+\frac{1}{2},\frac{\alpha}{2}+\frac{1}{2};\frac{\alpha}{2}+\frac{3}{2},\frac{\alpha}{2}+\frac{3}{2};a^2\,z^2\right)\left(-a^2\,z^2\right)^{\frac{\alpha+1}{2}} + (\alpha+1)^2\left(\sqrt{\pi}\,\text{erfi}(a\,z)\,(\alpha\log(b\,z)-1)\left(-a^2\,z^2\right)^{\frac{\alpha+1}{2}} + a\,z\left(\Gamma\left(\frac{\alpha+1}{2},-a^2\,z^2\right)(\alpha\log(b\,z)-1) - \alpha\,\Gamma\left(\frac{\alpha+1}{2}\right)\log(z)\right)\right)\right)\right)$$

06.28.21.0117.01

$$\int z\log(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{a\,z^3}{36\,\sqrt{\pi}\left(-a^2\,z^2\right)^{3/2}}\left(i\,a\,z\,\sqrt{-a^2\,z^2}\left(4\,a\,i\,z\,{}_2F_2\left(\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};a^2\,z^2\right) + 9\,i\,\sqrt{\pi}\,\text{erfi}(a\,z)\,(2\log(b\,z)-1)\right) - 9\left(\sqrt{\pi}\log(z) + \Gamma\left(\frac{3}{2},-a^2\,z^2\right)(1-2\log(b\,z))\right)\right)$$

06.28.21.0118.01

$$\int z^2\log(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{1}{18\,a^3\,\sqrt{\pi}}\left(2\,a^3\,\sqrt{\pi}\,\text{erfi}(a\,z)\,(3\log(b\,z)-1)\,z^3 - 3\,\text{Ei}\left(a^2\,z^2\right) + e^{a^2\,z^2}\left(2\,a^2\,z^2 + \left(6-6\,a^2\,z^2\right)\log(b\,z)+1\right)\right)$$

06.28.21.0119.01

$$\int z^3\log(b\,z)\,\text{erfi}(a\,z)\,dz = \frac{1}{400\,a^5\,\sqrt{\pi}\,z}\left(8\,a^6\,{}_2F_2\left(\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};a^2\,z^2\right)z^6 + 25\left(a^5\,\sqrt{\pi}\,\text{erfi}(a\,z)\,(4\log(b\,z)-1)\,z^5 + \sqrt{-a^2\,z^2}\left(3\,\sqrt{\pi}\log(z) + \Gamma\left(\frac{5}{2},-a^2\,z^2\right)(1-4\log(b\,z))\right)\right)\right)$$

Involving functions of the direct function

Involving elementary functions of the direct function

Involving powers of the direct function

06.28.21.0120.01

$$\int \text{erfi}(a\,z)^2\,dz = z\,\text{erfi}(a\,z)^2 - \frac{2\,e^{a^2\,z^2}\,\text{erfi}(a\,z)}{a\,\sqrt{\pi}} + \frac{1}{a}\sqrt{\frac{2}{\pi}}\,\text{erfi}\left(\sqrt{2}\,a\,z\right)$$

Involving products of the direct function

06.28.21.0121.01

$$\int \operatorname{erfi}(a z) \operatorname{erfi}(b z) \, dz = \frac{b}{a \sqrt{a^2+b^2} \sqrt{\pi}} \operatorname{erfi}\left(\frac{z a^2 + b^2 z}{\sqrt{a^2+b^2}}\right) + \frac{a}{b \sqrt{a^2+b^2} \sqrt{\pi}} \operatorname{erfi}\left(\frac{z a^2 + b^2 z}{\sqrt{a^2+b^2}}\right) + \frac{\left(a \sqrt{\pi}\, z \operatorname{erfi}(a z) - e^{a^2 z^2}\right) \operatorname{erfi}(b z)}{a \sqrt{\pi}} - \frac{e^{b^2 z^2} \operatorname{erfi}(a z)}{b \sqrt{\pi}}$$

Involving functions of the direct function and elementary functions

Involving elementary functions of the direct function and elementary functions

Involving powers of the direct function and a power function

06.28.21.0122.01

$$\int z^{\alpha-1} \operatorname{erfi}(a z)^2 \, dz = \frac{z^\alpha \operatorname{erfi}(a z)^2}{\alpha} - \frac{4 z^\alpha}{\alpha \pi} \left(-a^2 z^2\right)^{-\frac{\alpha}{2}} \sum_{k=0}^{\infty} \frac{(-1)^k \, \Gamma\left(k + \frac{\alpha}{2} + 1, -a^2 z^2\right)}{(2k+1)\, k!}$$

06.28.21.0123.01

$$\int z \operatorname{erfi}(a z)^2 \, dz = \frac{1}{4 a^2 \pi} \left(\left(2 a^2 \pi z^2 + \pi\right) \operatorname{erfi}(a z)^2 - 4 a e^{a^2 z^2} \sqrt{\pi}\, z \operatorname{erfi}(a z) + 2 e^{2 a^2 z^2}\right)$$

06.28.21.0124.01

$$\int z^2 \operatorname{erfi}(a z)^2 \, dz = \frac{1}{12} \left(4 \operatorname{erfi}(a z)^2 z^3 + \frac{1}{a^3 \pi} \left(4 a e^{2 a^2 z^2} z - 8 e^{a^2 z^2} \sqrt{\pi} \left(a^2 z^2 - 1\right) \operatorname{erfi}(a z) - 5 \sqrt{2 \pi} \operatorname{erfi}\left(\sqrt{2}\, a z\right)\right)\right)$$

06.28.21.0125.01

$$\int z^3 \operatorname{erfi}(a z)^2 \, dz = \frac{1}{16 a^4 \pi} \left(\pi \left(4 a^4 z^4 - 3\right) \operatorname{erfi}(a z)^2 - 4 a e^{a^2 z^2} \sqrt{\pi}\, z \left(2 a^2 z^2 - 3\right) \operatorname{erfi}(a z) + 4 e^{2 a^2 z^2} \left(a^2 z^2 - 2\right)\right)$$

Involving products of the direct function and a power function

06.28.21.0126.01

$$\int z^{\alpha-1} \operatorname{erfi}(a z) \operatorname{erfi}(b z) \, dz = \frac{z^\alpha \operatorname{erfi}(a z) \operatorname{erfi}(b z)}{\alpha} - \frac{2 b z^\alpha \left(-a^2 z^2\right)^{-\frac{\alpha}{2}}}{\pi \alpha a} \sum_{k=0}^{\infty} \frac{(-1)^k a^{-2k} b^{2k} \, \Gamma\left(k + \frac{\alpha}{2} + 1, -a^2 z^2\right)}{(2k+1)\, k!} - \frac{(2 a z^\alpha) \left(-b^2 z^2\right)^{-\frac{\alpha}{2}}}{\pi \alpha b} \sum_{k=0}^{\infty} \frac{(-1)^k a^{2k} b^{-2k} \, \Gamma\left(k + \frac{\alpha}{2} + 1, -b^2 z^2\right)}{(2k+1)\, k!}$$

06.28.21.0127.01

$$\int z^2 \operatorname{erfi}(a z) \operatorname{erfi}(b z) \, dz = \frac{1}{3 \pi^{3/2}} \left(-\frac{e^{a^2 z^2} \pi \operatorname{erfi}(b z) z^2}{a} + \frac{e^{(a^2+b^2) z^2} \sqrt{\pi} \, z}{a b} - \frac{\pi \operatorname{erf}\left(\sqrt{-(a^2+b^2) z^2}\right) z}{2 a b \sqrt{-(a^2+b^2) z^2}} + \frac{\pi z}{2 a b \sqrt{-(a^2+b^2) z^2}} + \frac{e^{a^2 z^2} \pi \operatorname{erfi}(b z)}{a^3} + \frac{\pi \operatorname{erfi}(a z) \left(b^3 \sqrt{\pi} \operatorname{erfi}(b z) z^3 + e^{b^2 z^2} \left(1 - b^2 z^2\right)\right)}{b^3} - \frac{b \pi \operatorname{erfi}\left(\sqrt{a^2+b^2} \, z\right)}{a^3 \sqrt{a^2+b^2}} - \frac{a \pi \operatorname{erfi}\left(\sqrt{a^2+b^2} \, z\right)}{b^3 \sqrt{a^2+b^2}} \right)$$

Involving power of the direct function and exponential function

06.28.21.0128.01

$$\int \frac{e^{a^2 z^2}}{\operatorname{erfi}(a z)} \, dz = \frac{\sqrt{\pi} \log(\operatorname{erfi}(a z))}{2 a}$$

06.28.21.0129.01

$$\int e^{a^2 z^2} \operatorname{erfi}(a z)^r \, dz = \frac{\sqrt{\pi} \operatorname{erfi}(a z)^{r+1}}{2 a (r+1)}$$

Involving direct function and Gamma-, Beta-, Erf-type functions

Involving erf-type functions

Involving erf

06.28.21.0130.01

$$\int \operatorname{erf}(b z) \operatorname{erfi}(a z) \, dz = \frac{1}{b \sqrt{\pi}} \left(\frac{\operatorname{erfi}\left(\sqrt{a^2 - b^2} \, z\right) b^2}{a \sqrt{a^2 - b^2}} + e^{-b^2 z^2} \operatorname{erfi}(a z) - \frac{a \operatorname{erf}\left(\sqrt{b^2 - a^2} \, z\right)}{\sqrt{b^2 - a^2}} \right) + \operatorname{erf}(b z) \left(z \operatorname{erfi}(a z) - \frac{e^{a^2 z^2}}{a \sqrt{\pi}} \right)$$

06.28.21.0131.01

$$\int \operatorname{erf}(a z) \operatorname{erfi}(a z) \, dz = \frac{e^{-a^2 z^2} \operatorname{erfi}(a z)}{a \sqrt{\pi}} + \operatorname{erf}(a z) \left(z \operatorname{erfi}(a z) - \frac{e^{a^2 z^2}}{a \sqrt{\pi}} \right)$$

Involving erfc

06.28.21.0132.01

$$\int \operatorname{erfc}(b z) \operatorname{erfi}(a z) \, dz = -\frac{1}{a b \sqrt{\pi}} \left(\frac{\operatorname{erfi}\left(\sqrt{a^2 - b^2} \, z\right) b^2}{\sqrt{a^2 - b^2}} + a e^{-b^2 z^2} \operatorname{erfi}(a z) \right) + \frac{a \operatorname{erf}\left(\sqrt{b^2 - a^2} \, z\right)}{b \sqrt{b^2 - a^2} \sqrt{\pi}} + \operatorname{erfc}(b z) \left(z \operatorname{erfi}(a z) - \frac{e^{a^2 z^2}}{a \sqrt{\pi}} \right)$$

06.28.21.0133.01

$$\int \operatorname{erfc}(a z) \operatorname{erfi}(a z) \, dz = \frac{\left(a \sqrt{\pi} \, z \operatorname{erfc}(a z) - e^{-a^2 z^2}\right) \operatorname{erfi}(a z)}{a \sqrt{\pi}} - \frac{e^{a^2 z^2} \operatorname{erfc}(a z)}{a \sqrt{\pi}}$$

Involving erf-type functions and a power function

Involving erf and power

06.28.21.0134.01

$$\int z^{\alpha-1} \operatorname{erf}(b z) \operatorname{erfi}(a z) \, dz = \frac{z^\alpha \operatorname{erf}(b z) \operatorname{erfi}(a z)}{\alpha} - \frac{2 b z^\alpha \left(-a^2 z^2\right)^{-\frac{\alpha}{2}}}{\pi \alpha a} \sum_{k=0}^{\infty} \frac{a^{-2k} b^{2k} \Gamma\left(k + \frac{\alpha}{2} + 1, -a^2 z^2\right)}{(2k+1) k!} + \frac{2 a z^\alpha \left(b^2 z^2\right)^{-\frac{\alpha}{2}}}{\pi \alpha b} \sum_{k=0}^{\infty} \frac{a^{2k} b^{-2k} \Gamma\left(k + \frac{\alpha}{2} + 1, b^2 z^2\right)}{(2k+1) k!}$$

06.28.21.0135.01

$$\int z^2 \operatorname{erf}(b z) \operatorname{erfi}(a z) \, dz = \frac{1}{3 \pi^{3/2}} \left(\frac{e^{-b^2 z^2} \pi \operatorname{erfi}(a z) z^2}{b} + \frac{\pi \operatorname{erf}\left(\sqrt{\left(b^2 - a^2\right) z^2}\right) z}{2 a b \sqrt{\left(b^2 - a^2\right) z^2}} - \frac{e^{\left(a^2 - b^2\right) z^2} \sqrt{\pi} \, z}{a b} + \frac{e^{-b^2 z^2} \pi \operatorname{erfi}(a z)}{b^3} + \frac{\pi \operatorname{erf}(b z) \left(a^3 \sqrt{\pi} \operatorname{erfi}(a z) z^3 + e^{a^2 z^2} \left(1 - a^2 z^2\right)\right)}{a^3} + \frac{\pi \sqrt{b^2 z^2 - a^2 z^2}}{2 a^3 b z - 2 a b^3 z} - \frac{b \pi \operatorname{erfi}\left(\sqrt{a^2 - b^2} \, z\right)}{a^3 \sqrt{a^2 - b^2}} - \frac{a \pi \operatorname{erf}\left(\sqrt{b^2 - a^2} \, z\right)}{b^3 \sqrt{b^2 - a^2}} \right)$$

06.28.21.0136.01

$$\int z^{\alpha-1} \operatorname{erf}(a z) \operatorname{erfi}(a z) \, dz = \frac{4 a^2 z^{\alpha+2}}{\pi \alpha} \left({}_2F_3\left(\frac{1}{2}, 1; \frac{3}{4}, \frac{5}{4}, \frac{3}{2}; \frac{a^4 z^4}{4}\right) - \frac{2}{\alpha + 2} \, {}_2F_3\left(1, \frac{\alpha}{4} + \frac{1}{2}; \frac{3}{4}, \frac{5}{4}, \frac{\alpha}{4} + \frac{3}{2}; \frac{a^4 z^4}{4}\right)\right)$$

Involving erfc and power

06.28.21.0137.01

$$\int z^{\alpha-1} \operatorname{erfc}(b z) \operatorname{erfi}(a z) \, dz = \frac{2 b z^\alpha \left(-a^2 z^2\right)^{-\frac{\alpha}{2}}}{\pi \alpha a} \sum_{k=0}^{\infty} \frac{a^{-2k} b^{2k} \Gamma\left(k + \frac{\alpha}{2} + 1, -a^2 z^2\right)}{(2k+1) k!} + \frac{a \left(-a^2 z^2\right)^{\frac{1}{2}(-\alpha-1)}}{\sqrt{\pi} \, \alpha} z^{\alpha+1} \Gamma\left(\frac{\alpha+1}{2}, -a^2 z^2\right) + \frac{z^\alpha \operatorname{erfc}(b z) \operatorname{erfi}(a z)}{\alpha} - \frac{2 a z^\alpha \left(b^2 z^2\right)^{-\frac{\alpha}{2}}}{\pi \alpha b} \sum_{k=0}^{\infty} \frac{a^{2k} b^{-2k} \Gamma\left(k + \frac{\alpha}{2} + 1, b^2 z^2\right)}{(2k+1) k!}$$

06.28.21.0138.01

$$\int z^2 \operatorname{erfc}(b z) \operatorname{erfi}(a z) \, dz = \frac{1}{3 \pi^{3/2}} \left(\pi^{3/2} \operatorname{erfc}(b z) \operatorname{erfi}(a z) z^3 - \frac{e^{a^2 z^2} \pi \operatorname{erfc}(b z) z^2}{a} - \frac{e^{-b^2 z^2} \pi \operatorname{erfi}(a z) z^2}{b} + \frac{e^{(a^2-b^2) z^2} \sqrt{\pi} \, z}{a b} - \frac{\pi \operatorname{erf}\left(\sqrt{(b^2-a^2) z^2}\right) z}{2 a b \sqrt{(b^2-a^2) z^2}} + \frac{\pi z}{2 a b \sqrt{(b^2-a^2) z^2}} + \frac{a \pi \operatorname{erf}\left(\sqrt{b^2-a^2} \, z\right)}{b^3 \sqrt{b^2-a^2}} + \frac{e^{a^2 z^2} \pi \operatorname{erfc}(b z)}{a^3} + \frac{b \pi \operatorname{erfi}\left(\sqrt{a^2-b^2} \, z\right)}{a^3 \sqrt{a^2-b^2}} - \frac{e^{-b^2 z^2} \pi \operatorname{erfi}(a z)}{b^3} \right)$$

06.28.21.0139.01

$$\int z^{\alpha-1} \operatorname{erfc}(a z) \operatorname{erfi}(a z) \, dz = \frac{z^\alpha}{2 \alpha} \left(2 \operatorname{erfi}(a z) + \frac{2 a z \left(-a^2 z^2\right)^{-\frac{\alpha+1}{2}}}{\sqrt{\pi}} \Gamma\left(\frac{\alpha+1}{2}, -a^2 z^2\right) - \frac{8 a^2 z^2}{\pi} \, {}_2F_3\left(\frac{1}{2}, 1; \frac{3}{4}, \frac{5}{4}, \frac{3}{2}; \frac{a^4 z^4}{4}\right) + \sqrt{2} \, a^2 z^2 \, \Gamma\left(\frac{\alpha+2}{4}\right) {}_2\tilde{F}_3\left(1, \frac{\alpha+2}{4}; \frac{3}{4}, \frac{5}{4}, \frac{\alpha+6}{4}; \frac{a^4 z^4}{4}\right) \right)$$

Representations through more general functions

Through hypergeometric functions

Involving ${}_1F_1$

06.28.26.0001.01

$$\operatorname{erfi}(z) = \frac{2 z}{\sqrt{\pi}} \, {}_1F_1\left(\frac{1}{2}; \frac{3}{2}; z^2\right)$$

Involving ${}_pF_q$

06.28.26.0022.01

$$\operatorname{erfi}(z) = \frac{2 z}{\sqrt{\pi}} \, {}_1F_2\left(\frac{1}{4}; \frac{1}{2}, \frac{5}{4}; \frac{z^4}{4}\right) + \frac{2 z^3}{3 \sqrt{\pi}} \, {}_1F_2\left(\frac{3}{4}; \frac{3}{2}, \frac{7}{4}; \frac{z^4}{4}\right)$$

Involving hypergeometric U

06.28.26.0002.01

$$\operatorname{erfi}(z) = \frac{z}{\sqrt{-z^2}} \left(1 - \frac{1}{\sqrt{\pi}} e^{z^2} U\left(\frac{1}{2}, \frac{1}{2}, -z^2\right)\right)$$

Through Meijer G

Classical cases for the direct function itself

06.28.26.0003.01

$$\operatorname{erfi}(z) = \frac{z}{\sqrt{\pi}} G_{1,2}^{1,1}\left(-z^2 \,\middle|\, \begin{matrix} \frac{1}{2} \\ 0, -\frac{1}{2} \end{matrix}\right)$$

06.28.26.0004.01

$$\operatorname{erfi}(z) = -\frac{\sqrt{-z^2}}{\sqrt{\pi}\, z}\, G_{1,2}^{1,1}\!\left(-z^2 \,\middle|\, \begin{matrix} 1 \\ \frac{1}{2}, 0 \end{matrix}\right)$$

06.28.26.0005.01

$$\operatorname{erfi}(z) = \frac{i}{\sqrt{\pi}}\, G_{1,2}^{1,1}\!\left(-z^2 \,\middle|\, \begin{matrix} 1 \\ \frac{1}{2}, 0 \end{matrix}\right) /;\ \operatorname{Im}(z) > 0$$

06.28.26.0006.01

$$\operatorname{erfi}\left(\sqrt{z}\right) - \frac{1}{\sqrt{\pi}} \sqrt{z}\, G_{1,2}^{1,1}\!\left(-z \,\middle|\, \begin{matrix} \frac{1}{2} \\ 0, -\frac{1}{2} \end{matrix}\right) \operatorname{erfi}\left(\sqrt{z}\right) - \frac{1}{\sqrt{\pi}} \sqrt{z}\, G_{1,2}^{1,1}\!\left(-z \,\middle|\, \begin{matrix} \frac{1}{2} \\ 0, -\frac{1}{2} \end{matrix}\right)$$

Classical cases involving exp

06.28.26.0007.01

$$e^{-z^2} \operatorname{erfi}(z) = G_{1,2}^{1,1}\!\left(z^2 \,\middle|\, \begin{matrix} \frac{1}{2} \\ \frac{1}{2}, 0 \end{matrix}\right) /;\ -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

06.28.26.0008.01

$$e^{-z} \operatorname{erfi}\left(\sqrt{z}\right) = G_{1,2}^{1,1}\!\left(z \,\middle|\, \begin{matrix} \frac{1}{2} \\ \frac{1}{2}, 0 \end{matrix}\right)$$

Classical cases involving erf

06.28.26.0009.01

$$\operatorname{erf}\left(\sqrt[4]{z}\right) \operatorname{erfi}\left(\sqrt[4]{z}\right) = -\pi \sqrt{2}\, G_{3,5}^{1,2}\!\left(\frac{z}{4} \,\middle|\, \begin{matrix} \frac{1}{2}, 1, 0 \\ \frac{1}{2}, \frac{1}{4}, \frac{3}{4}, 0, 0 \end{matrix}\right)$$

Classical cases involving erfc

06.28.26.0010.01

$$\operatorname{erfi}\left(\sqrt[4]{z}\right) \operatorname{erfc}\left(\sqrt[4]{z}\right) = \frac{1}{\pi \sqrt{2}}\, G_{2,4}^{3,1}\!\left(\frac{z}{4} \,\middle|\, \begin{matrix} \frac{1}{2}, 1 \\ \frac{1}{4}, \frac{3}{4}, \frac{1}{2}, 0 \end{matrix}\right)$$

Generalized cases for the direct function itself

06.28.26.0011.01

$$\operatorname{erfi}(z) = -\frac{i}{\sqrt{\pi}}\, G_{1,2}^{1,1}\!\left(i z, \frac{1}{2} \,\middle|\, \begin{matrix} 1 \\ \frac{1}{2}, 0 \end{matrix}\right)$$

06.28.26.0012.01

$$\operatorname{erfi}(z) = -i + \frac{i}{\sqrt{\pi}}\, G_{1,2}^{2,0}\!\left(i z, \frac{1}{2} \,\middle|\, \begin{matrix} 1 \\ 0, \frac{1}{2} \end{matrix}\right)$$

06.28.26.0023.01

$$\operatorname{erfi}(z) = \pi\, G_{1,3}^{1,0}\!\left(\frac{z}{\sqrt{2}}, \frac{1}{4} \,\middle|\, \begin{matrix} 1 \\ \frac{1}{4}, 0, \frac{3}{4} \end{matrix}\right) + \pi\, G_{1,3}^{1,0}\!\left(\frac{z}{\sqrt{2}}, \frac{1}{4} \,\middle|\, \begin{matrix} 1 \\ \frac{3}{4}, 0, \frac{1}{4} \end{matrix}\right)$$

Generalized cases involving exp

06.28.26.0013.01

$$e^{-z^2}\operatorname{erfi}(z) = G_{1,2}^{1,1}\left(z, \frac{1}{2} \,\middle|\, \begin{matrix} \frac{1}{2} \\ \frac{1}{2}, 0 \end{matrix}\right)$$

Generalized cases involving erf

06.28.26.0014.01

$$\operatorname{erf}(z)\operatorname{erfi}(z) = -\pi\sqrt{2}\, G_{3,5}^{1,2}\left(\frac{z}{\sqrt{2}}, \frac{1}{4} \,\middle|\, \begin{matrix} \frac{1}{2}, 1, 0 \\ \frac{1}{2}, \frac{1}{4}, \frac{3}{4}, 0, 0 \end{matrix}\right)$$

06.28.26.0015.01

$$\operatorname{erf}(z) + \operatorname{erfi}(z) = 2\pi\, G_{1,3}^{1,0}\left(\frac{z}{\sqrt{2}}, \frac{1}{4} \,\middle|\, \begin{matrix} 1 \\ \frac{1}{4}, 0, \frac{3}{4} \end{matrix}\right)$$

06.28.26.0016.01

$$\operatorname{erf}(z) - \operatorname{erfi}(z) = -2\pi\, G_{1,3}^{1,0}\left(\frac{z}{\sqrt{2}}, \frac{1}{4} \,\middle|\, \begin{matrix} 1 \\ \frac{3}{4}, 0, \frac{1}{4} \end{matrix}\right)$$

Generalized cases involving erfc

06.28.26.0017.01

$$\operatorname{erfi}(z)\operatorname{erfc}(z) = \frac{1}{\pi\sqrt{2}}\, G_{2,4}^{3,1}\left(\frac{z}{\sqrt{2}}, \frac{1}{4} \,\middle|\, \begin{matrix} \frac{1}{2}, 1 \\ \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 0 \end{matrix}\right)$$

Through other functions

06.28.26.0018.01

$$\operatorname{erfi}(z) = i\operatorname{erf}(i z, 0)$$

06.28.26.0019.01

$$\operatorname{erfi}(z) = \frac{\sqrt{-z^2}}{z}\left(\frac{1}{\sqrt{\pi}}\Gamma\left(\frac{1}{2}, -z^2\right) - 1\right)$$

06.28.26.0020.01

$$\operatorname{erfi}(z) = \frac{\sqrt{-z^2}}{z}\left(Q\left(\frac{1}{2}, -z^2\right) - 1\right)$$

06.28.26.0021.01

$$\operatorname{erfi}(z) = -\frac{\sqrt{-z^2}}{z} - \frac{z}{\sqrt{\pi}} E_{\frac{1}{2}}\left(-z^2\right)$$

Representations through equivalent functions

With inverse function

06.28.27.0001.01

$$\operatorname{erfi}\left(i\operatorname{erf}^{-1}(z)\right) = i z$$

06.28.27.0005.01

$$\text{erfi}\left(i\,\text{erfc}^{-1}(1-z)\right) == i\,z$$

06.28.27.0006.01

$$\text{erfi}\left(i\,\text{erf}^{-1}(0, z)\right) == i\,z$$

With related functions

06.28.27.0002.01

$$\text{erfi}(z) == i\,\text{erfc}(i\,z) - i$$

06.28.27.0003.01

$$\text{erfi}(z) == -i\,\text{erf}(i\,z)$$

06.28.27.0004.01

$$\text{erfi}(z) == (1-i)\left(C\left(\frac{(1+i)\,z}{\sqrt{\pi}}\right) - i\,S\left(\frac{(1+i)\,z}{\sqrt{\pi}}\right)\right)$$

Zeros

06.28.30.0001.01

$$\text{erfi}(z) == 0 \;/;\; z == 0$$

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