

NEW FORMULA 4.131.1

The original formula is

$$\int_0^{\infty} \sin ax \sinh^{\nu} \gamma x e^{-\beta x} dx = -\frac{i\Gamma(\nu+1)}{2^{\nu+2}\gamma} \left\{ \frac{\Gamma\left(\frac{\beta-\nu\gamma-ai}{2\gamma}\right)}{\Gamma\left(\frac{\beta+\nu\gamma-ai}{2\gamma}+1\right)} - \frac{\Gamma\left(\frac{\beta-\nu\gamma+ai}{2\gamma}\right)}{\Gamma\left(\frac{\beta+\nu\gamma+ai}{2\gamma}+1\right)} \right\}$$

and the change of variables $t = \gamma x$ and replacing a/γ by a and β/γ by b is

$$\int_0^{\infty} \sin ax \sinh^{\nu} x e^{-bx} dx = -\frac{i\Gamma(\nu+1)}{2^{\nu+2}\gamma} \left\{ \frac{\Gamma\left(\frac{b-\nu-ai}{2}\right)}{\Gamma\left(\frac{b+\nu-ai}{2}+1\right)} - \frac{\Gamma\left(\frac{b-\nu+ai}{2}\right)}{\Gamma\left(\frac{b+\nu+ai}{2}+1\right)} \right\}$$