



Fourier Sine Transforms: General Formulas

No	<i>Original function</i> , $f(x)$	<i>Sine transform</i> , $\check{f}_s(u) = \int_0^\infty f(x) \sin(ux) dx$
1	$af_1(x) + bf_2(x)$	$a\check{f}_{1s}(u) + b\check{f}_{2s}(u)$
2	$f(ax), \quad a > 0$	$\frac{1}{a} \check{f}_s\left(\frac{u}{a}\right)$
3	$x^{2n} f(x), \quad n = 1, 2, \dots$	$(-1)^n \frac{d^{2n}}{du^{2n}} \check{f}_s(u)$
4	$x^{2n+1} f(ax), \quad n = 0, 1, \dots$	$(-1)^{n+1} \frac{d^{2n+1}}{du^{2n+1}} \check{f}_c(u), \quad \check{f}_c(u) = \int_0^\infty f(x) \cos(xu) dx$
5	$f(ax) \cos(bx), \quad a, b > 0$	$\frac{1}{2a} \left[\check{f}_s\left(\frac{u+b}{a}\right) + F_s\left(\frac{u-b}{a}\right) \right]$

References

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Polyanin, A. D. and Manzhirov, A. V., *Handbook of Integral Equations*, CRC Press, Boca Raton, 1998.