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Fourier Cosine Transforms: General Formulas

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

References

Bateman, H. and Erdélyi, A., *Tables of Integral Transforms. Vols. 1 and 2*, McGraw-Hill Book Co., New York, 1954. Ditkin, V. A. and Prudnikov, A. P., *Integral Transforms and Operational Calculus*, Pergamon Press, New York, 1965. Polyanin, A. D. and Manzhirov, A. V., *Handbook of Integral Equations*, CRC Press, Boca Raton, 1998.

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