Doc Dave

Useful Bits

Common Fourier Transforms

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Function, $f(t)$	Fourier transform	Remarks
$f(t) = \mathcal{F}^{-1}(F(\omega))$ $f(t) = \frac{1}{2\pi}\int_{-\infty}^{\infty} F(\omega)e^{i\omega t}\ d\omega$	$F(\omega) = \mathcal{F}(f(t))$ $F(\omega) = \int_{-\infty}^{\infty} f(t)e^{-i\omega t}\ dt$	Definition
$f(t-t_0)$	$F(\omega)e^{-i\omega t_0}$	Time shifting
$f(t)e^{i\omega_0 t}$	$F(\omega-\omega_0)$	Frequency shifting
$f(\alpha t)$	$\frac{1}{\lvert\alpha\rvert}F\left(\frac{\omega}{\alpha}\right)$	Time scaling
$\frac{1}{\lvert\alpha\rvert}f(\frac{\omega}{\alpha})$	$F\left(\alpha\omega\right)$	Frequency scaling
$\frac{df(t)}{dt}$	$i\omega F(\omega)$	Differentiation