A table of Fourier transforms and properties

Forward: $F(\nu) = \int_{-\infty}^{\infty} f(t)\, \mathrm{e}^{-\mathrm{j}2\pi\nu t} dt$ Inverse: $f(t) = \int_{-\infty}^{\infty} F(\nu)\, \mathrm{e}^{\mathrm{j}2\pi\nu t} d\nu$

Some properties			Some transform pairs		
$F(t)$	$\longleftrightarrow$	$f(-\nu)$	$\delta(t)$	$\longleftrightarrow$	1
$f^*(t)$	$\longleftrightarrow$	$F^*(-\nu)$	$u(t)\, \mathrm{e}^{-at}$	$\longleftrightarrow$	$\frac{1}{\mathrm{j}2\pi\nu + a}$
$f(at)$	$\longleftrightarrow$	$\frac{1}{\lvert a \rvert} F\left(\frac{\nu}{a}\right)$	$u(t)$	$\longleftrightarrow$	$\frac{1}{2}\delta(\nu) + \frac{1}{\mathrm{j}2\pi\nu}$
$f(t - t_0)$	$\longleftrightarrow$	$\mathrm{e}^{-\mathrm{j}2\pi\nu t_0} F(\nu)$	$\exp(\mathrm{j}2\pi\nu_0 t)$	$\longleftrightarrow$	$\delta(\nu - \nu_0)$
$\mathrm{e}^{\mathrm{j}2\pi\nu_0 t} f(t)$	$\longleftrightarrow$	$F(\nu - \nu_0)$	$\cos(2\pi\nu_0 t)$	$\longleftrightarrow$	$\frac{1}{2}\left[\delta(\nu - \nu_0) + \delta(\nu + \nu_0)\right]$
$\frac{d^n}{dt^n} f(t)$	$\longleftrightarrow$	$(\mathrm{j}2\pi\nu)^n F(\nu)$	$\sin(2\pi\nu_0 t)$	$\longleftrightarrow$	$\frac{1}{2\mathrm{j}}\left[\delta(\nu - \nu_0) - \delta(\nu + \nu_0)\right]$
$-\mathrm{j}2\pi t f(t)$	$\longleftrightarrow$	$\frac{dF(\nu)}{d\nu}$	$\Pi(t)$	$\longleftrightarrow$	$\mathrm{sinc}(\nu)$
$\int_{-\infty}^{t} f(\tau)\, d\tau$	$\longleftrightarrow$	$\frac{1}{\mathrm{j}2\pi\nu} F(\nu) + \frac{1}{2} F(0)\, \delta(\nu)$	$\mathrm{sgn}(t)$	$\longleftrightarrow$	$\frac{1}{\mathrm{j}\pi\nu}$
$(f * g)(t)$	$\longleftrightarrow$	$F(\nu)\, G(\nu)$	$\sum_{k=-\infty}^{\infty} \delta(t - kT)$	$\longleftrightarrow$	$\frac{1}{T} \sum_{k=-\infty}^{\infty} \delta\left(\nu - \frac{k}{T}\right)$
$f(t)\, g(t)$	$\longleftrightarrow$	$(F * G)(\nu)$	$\exp(-\pi t^2)$	$\longleftrightarrow$	$\exp(-\pi\nu^2)$

DFT: $X[r] = \frac{1}{N} \sum_{k=0}^{N-1} x[k] \exp\left(-\frac{\mathrm{j}2\pi rk}{N}\right)$ IDFT: $x[k] = \sum_{r=0}^{N-1} X[r] \exp\left(\frac{\mathrm{j}2\pi rk}{N}\right)$

Hilbert transform: $\hat{f}(t) = f(t) * \frac{1}{\pi t}$

Convolution integral: $(f * h)(t) = \int_{-\infty}^{\infty} f(\tau)\, h(t - \tau)\, \mathrm{d}\tau$