Fourier transform pairs

Function	*v(t)*	*V(f)*
Rectangle of unit width	$\Pi(t)$	$\mathrm{sinc}(f)$
Delayed rectangle of width τ	$\Pi\left(\frac{t-T}{\tau}\right)$	$\tau\,\mathrm{sinc}(\tau \cdot f) \cdot e^{-j\omega T}$
Triangle of base width 2τ	$\Lambda\left(\frac{t}{\tau}\right)$	$\tau\,\mathrm{sinc}^2(\tau \cdot f)$
Gaussian	$e^{-\pi(t/\tau)^2}$	$\tau \cdot e^{-\pi(\tau \cdot f)^2}$
One sided exponential	$u(t) \cdot e^{-t/\tau}$	$\frac{\tau}{1 + j2\pi\tau \cdot f}$
Two sided exponential	$e^{-\lvert t\rvert/\tau}$	$\frac{2\tau}{1 + (2\pi\tau \cdot f)^2}$
sinc	$\mathrm{sinc}(2f_x t)$	$\frac{1}{2f_x}\Pi\left(\frac{f}{2f_x}\right)$
Constant	1	$\delta(f)$
Phasor	$e^{j(\omega_c t + \phi)}$	$e^{j\phi} \cdot \delta(f - f_c)$
Sine wave	$\sin(\omega_c t + \phi)$	$\frac{1}{2j}\left[e^{j\phi} \cdot \delta(f - f_c) - e^{-j\phi} \cdot \delta(f + f_c)\right]$
Cosine wave	$\cos(\omega_c t + \phi)$	$\frac{1}{2}\left[e^{j\phi} \cdot \delta(f - f_c) + e^{-j\phi} \cdot \delta(f + f_c)\right]$
Impulse	$\delta(t - T)$	$e^{-j\omega T}$
Sampling	$\sum_{k=-\infty}^{\infty} \delta(t - kT_s)$	$f_s \cdot \sum_{n=-\infty}^{\infty} \delta(f - nf_s)$
Signum	$\mathrm{sgn}(t)$	$\frac{1}{j\pi \cdot f}$
Heaviside step	$u(t)$	$\frac{1}{2} \cdot \delta(f) + \frac{1}{j2\pi \cdot f}$

Fourier transform theorems

Linearity	$a \cdot v(t) + b \cdot w(t)$	$a \cdot V(f) + b \cdot W(f)$
Time delay	$v(t-T)$	$V(f) \cdot e^{-j\omega T}$
Change of scale	$v(at)$	$\frac{1}{\lvert a \rvert} \cdot V\left(\frac{f}{a}\right)$
Time reversal	$v(-t)$	$V(-f)$
Time conjugation	$v^*(t)$	$V^*(-f)$
Frequency conjugation	$v^*(-t)$	$V^*(f)$
Duality	$V(t)$	$v(-f)$
Frequency translation	$v(t) \cdot e^{j\omega_c t}$	$V(f - f_c)$
Modulation	$v(t) \cdot \cos(\omega_c t + \phi)$	$\frac{1}{2} \cdot \left[e^{j\phi} \cdot V(f - f_c) + e^{-j\phi} \cdot V(f + f_c)\right]$
Time differentiation	$\frac{d^n}{dt^n} v(t)$	$(j2\pi \cdot f)^n \cdot V(f)$
Integration (1)	$\int_{-\infty}^{t} v(t')dt'$	$(j2\pi \cdot f)^{-1} \cdot V(f) + \frac{1}{2} V(0) \cdot \delta(f)$
Integration (2)	$\int_{0}^{t} v_e(t')dt' + \int_{-\infty}^{t} v_0(t')dt'$	$(j2\pi \cdot f)^{-1} \cdot V(f)$
Convolution	$v(t) * w(t)$	$V(f) \cdot W(f)$
Multiplication	$v(t) \cdot w(t)$	$V(f) * W(f)$
Frequency differentiation	$t^n \cdot v(t)$	$(-j2\pi)^{-n} \frac{d^n}{df^n} V(t)$