Table of Fourier Transforms

This table will appear on the final exam.

$f(t)$	$F(\omega) = F[f(t)]$	
$f(t)$	$\frac{1}{2\pi}\int_{-\infty}^{\infty} f(t)e^{-i\omega t}\,dt$	Definition of Fourier transform
$\int_{-\infty}^{\infty} F(\omega)e^{i\omega t}\,d\omega$	$F(\omega)$	The Fourier relations
$u_0(t)f(t)$	$\frac{1}{2\pi}\mathcal{L}[f(t)]$ with $s = i\omega$	Relation to Laplace transform
$cf(t) + g(t)$	$cF[f(t)] + F[g(t)]$	Linearity
$f(at)$	$\frac{1}{a}F\left(\frac{\omega}{a}\right)$	Scaling
$f(t-a)$	$e^{-ia\omega}F(\omega)$	Shifting 1
$e^{iat}f(t)$	$F[f(t-a)]$	Shifting 2
$f'(t)$	$i\omega F(\omega)$	First derivative in t
$f''(t)$	$-\omega^2 F(\omega)$	Second derivative in t
$itf(t)$	$F'(\omega)$	First derivative in ω