Laplace Transform Table

Function	Laplace Transform
t^n, $n = 0, 1, \ldots$	$n!/s^{n+1}$
t^n, $n > -1$	$\Gamma(n+1)/s^{n+1}$
e^{at}	$1/(s-a)$
$t^n e^{at}$	$n!/(s-a)^{n+1}$
$e^{at}\cos(\omega t)$	$(s-a)/((s-a)^2+\omega^2)$
$e^{at}\sin(\omega t)$	$\omega/((s-a)^2+\omega^2)$
$e^{at}(\sin(\omega t) - \omega t\cos(\omega t))$	$2\omega^3/((s-a)^2+\omega^2)^2$
$te^{at}\sin(\omega t)$	$2\omega(s-a)/((s-a)^2+\omega^2)^2$
$f'(t)$	$s\mathcal{L}(f) - f(0)$
$f''(t)$	$s^2\mathcal{L}(f) - sf(0) - f'(0)$
$f^{(n)}(t)$	$s^n\mathcal{L}(f) - s^{n-1}f(0) - \cdots - sf^{(n-2)}(0) - f^{(n-1)}(0)$
$e^{at}f(t)$	$\mathcal{L}(f)(s-a)$, i.e., plug in $s-a$ for s.
$tf(t)$	$-\mathcal{L}(f)'$
$t^n f(t)$	$(-1)^n\mathcal{L}(f)^{(n)}$
$\int_0^t g(t-u)f(u)\,du = f * g$	$\mathcal{L}(f)\mathcal{L}(g)$
$H_c(t)f(t-c)$	$e^{-cs}\mathcal{L}(f)$
$\delta(t-c)f(t)$	$e^{-cs}f(c)$
$f(t)$	$\int_0^\infty e^{-st}f(t)\,dt$

Note that the variable s and the function f can be complex valued. Thus the results for trig functions actually follow from those for exponential functions.

The gamma function above is $\Gamma(x) = \int_0^\infty x^{n-1}e^{-x}\,dx$. It satisfies $\Gamma(x+1) = x\Gamma(x)$ and $\Gamma(n+1) = n!$ for n a positive integer. Also $\Gamma(1/2) = \sqrt{\pi}$.