Tabla de propiedades de la Transformada de Laplace

	$\ell[af(t)] = aF(s)$
Linealidad	$\ell[f_1(t)+f_2(t)] = F_1(s)+F_2(s)$
Desplazamiento en el tiempo	$\ell[f(t-\tau)u(t-\tau)] = e^{-s\tau}F(s)$
Impulso	$\ell[\delta(t)] = 1$
Desplazamiento de frecuencia	$\ell[e^{-at}f(t)] = F(s+a)$
Derivada	$\ell\left[\frac{df(t)}{dt}\right] = sF(s)-f(0)$
Integral	$\ell\left[\int_a^t f(t)dt\right] = \frac{F(s)}{s} + \frac{\left[\int_a^t f(t)dt\right]_{t=0}}{s}$

Teorema del valor inicial	$\lim_{t\to 0} f(t) = \lim_{s\to\infty} sF(s)$
Teorema del valor final	$\lim_{t\to\infty} f(t) = \lim_{s\to 0} sF(s)$
Tiempo por una función	$\ell[tf(t)] = \frac{-dF(s)}{ds}$ donde $F(s) = \ell[f(t)]$
	$\ell[f(at)] = \frac{1}{a}F\left(\frac{s}{a}\right)$
	$\ell[t^n f(t)] = (-1)^n \frac{d^nF(s)}{ds^n}$
	$\ell\left[f\left(\frac{t}{a}\right)\right] = aF(as)$
	$\ell\left[\frac{f(t)}{t}\right] = \int_s^\infty F(s)ds$

Pares de Transformadas de Laplace

f(t)		***F(s)***
1	Impulso unitario	1
$u(t)$	Escalón unitario	$\frac{1}{s}$
a	Escalón	$\frac{a}{s}$
at	Rampa	$\frac{a}{s^2}$
$e^{\mp at}$	Exponencial	$\frac{1}{s\pm a}$
$\text{sen}\,\omega t$	Seno	$\frac{\omega}{s^2+\omega^2}$
$\cos\omega t$	Coseno	$\frac{s}{s^2+\omega^2}$
$e^{-at}\,\text{sen}\,\omega t$	Seno amortiguado	$\frac{\omega}{(s+a)^2+\omega^2}$
$e^{-at}\cos\omega t$	Coseno amortiguado	$\frac{s+a}{(s+a)^2+\omega^2}$
t^n		$\frac{n!}{s^{n+1}}$
$t^n e^{-at}$		$\frac{n!}{(s+a)^{n+1}}$
$t\cos\omega t$		$\frac{s^2-\omega^2}{(s^2+\omega^2)^2}$
$\frac{t}{2\omega}\,\text{sen}\,\omega t$		$\frac{s}{(s^2+\omega^2)^2}$

f(t)	***F(s)***
$\frac{t^{n-1}}{(n-1)!}$	$\frac{1}{s^n}$
$\frac{t^{n-1}e^{\mp at}}{(n-1)!}$ Rampa amortiguada	$\frac{1}{(s\pm a)^n}$
$\frac{1}{a}(1-e^{-at})$	$\frac{1}{s(s+a)}$
$\frac{1}{a^2}(at-1+e^{-at})$	$\frac{1}{s^2(s+a)}$
$\frac{1}{b-a}(e^{-at}-e^{-bt})$	$\frac{1}{(s+a)(s+b)}$
$\frac{1}{b-a}(be^{-bt}-ae^{-at})$	$\frac{s}{(s+a)(s+b)}$
$\frac{1}{ab}\left[1+\frac{1}{a-b}(be^{-at}-ae^{-bt})\right]$	$\frac{1}{s(s+a)(s+b)}$
$sh\omega t$	$\frac{\omega}{s^2-\omega^2}$
$ch\omega t$	$\frac{s}{s^2-\omega^2}$
$\frac{\omega_n}{\sqrt{1-\xi^2}}e^{-\xi\omega_n t}\,\text{sen}\,\omega_n\sqrt{1-\xi^2}\,t$	$\frac{\omega_n^2}{s^2+2\xi\omega_n s+\omega_n^2}$
$-\frac{1}{\sqrt{1-\xi^2}}e^{-\xi\omega_n t}\,\text{sen}\left(\omega_n\sqrt{1-\xi^2}\,t - \arctan\frac{\sqrt{1-\xi^2}}{\xi}\right)$	$\frac{s}{s^2+2\xi\omega_n s+\omega_n^2}$
$1-\frac{1}{\sqrt{1-\xi^2}}e^{-\xi\omega_n t}\,\text{sen}\left(\omega_n\sqrt{1-\xi^2}\,t + \arctan\frac{\sqrt{1-\xi^2}}{\xi}\right)$	$\frac{\omega_n^2}{s(s^2+2\xi\omega_n s+\omega_n^2)}$
$2\lvert K\rvert e^{-\alpha t}\cos(\beta t+\theta)$ K es un nº complejo = $\lvert K\rvert\underline{\theta}$	$\frac{K}{s+\alpha-\beta j}+\frac{K^*}{s+\alpha+\beta j}$
$2t\lvert K\rvert e^{-\alpha t}\cos(\beta t+\theta)$ K es un nº complejo = $\lvert K\rvert\underline{\theta}$	$\frac{K}{(s+\alpha-\beta j)^2}+\frac{K^*}{(s+\alpha+\beta j)^2}$