Properties of the unilateral Laplace transform

	Time domain	s domain
Linearity	$af(t) + bg(t)$	$aF(s) + bG(s)$
Frequency-domain derivative	$tf(t)$	$-F'(s)$
Frequency-domain general derivative	$t^n f(t)$	$(-1)^n F^{(n)}(s)$
Derivative	$f'(t)$	$sF(s) - f(0)$
Second derivative	$f''(t)$	$s^2F(s) - sf(0) - f'(0)$
General derivative	$f^{(n)}(t)$	$s^nF(s) - \sum_{k=1}^{n} s^{n-k} f^{(k-1)}(0)$
Frequency-domain integration	$\frac{1}{t}f(t)$	$\int_s^\infty F(\sigma)\,d\sigma$
Time-domain integration	$\int_0^t f(\tau)\,d\tau = (u * f)(t)$	$\frac{1}{s}F(s)$
Frequency shifting	$e^{at}f(t)$	$F(s-a)$
Time shifting	$f(t-a)u(t-a)$	$e^{-as}F(s)$
Time scaling	$f(at)$	$\frac{1}{a}F\left(\frac{s}{a}\right)$
Multiplication	$f(t)g(t)$	$\frac{1}{2\pi i}\lim_{T\to\infty}\int_{c-iT}^{c+iT} F(\sigma)G(s-\sigma)\,d\sigma$
Convolution	$(f * g)(t) = \int_0^t f(\tau)g(t-\tau)\,d\tau$	$F(s)\cdot G(s)$