Table 4.1: Properties of the Laplace Transform

$\mathcal{L}\{\alpha_1 f_1(t) + \alpha_2 f_2(t)\}$	$\alpha_1 F_1(s) + \alpha_2 F_2(s)$
$\mathcal{L}\{f(t-t_0)u(t-t_0)\}$	$e^{-st_0}F(s), \quad t_0 > 0$
$\mathcal{L}\{f(at)\}$	$\frac{1}{a}F\left(\frac{s}{a}\right), \quad a > 0$
$\mathcal{L}\{t^n f(t)\}$	$(-1)^n \frac{d^n}{ds^n}F(s)$
$e^{\lambda t}f(t)$	$F(s-\lambda)$
$f(t)\cos(\omega_0 t)$ $f(t)\sin(\omega_0 t)$	$\frac{1}{2}[F(s+j\omega_0) + F(s-j\omega_0)]$ $\frac{j}{2}[F(s+j\omega_0) - F(s-j\omega_0)]$
$\mathcal{L}\left\{\frac{d}{dt}f(t)\right\}$	$sF(s) - f(0^-)$
$\mathcal{L}\left\{\frac{d^2}{dt^2}f(t)\right\}$	$s^2F(s) - sf(0^-) - f^{(1)}(0^-)$
$\mathcal{L}\left\{\frac{d^n}{dt^n}f(t)\right\}$	$s^nF(s) - s^{n-1}f(0^-) - s^{n-2}f^{(1)}(0^-)$ $- \cdots - f^{(n-1)}(0^-)$
$\mathcal{L}\{f_1(t) * f_2(t)\}$	$F_1(s)F_2(s)$
$\mathcal{L}\{\int_0^t f(\tau)d\tau\}$	$\frac{1}{s}F(s)$
$\lim_{t\to 0^+}\{f(t)\}$	$\lim_{s\to\infty}\{sF(s)\}$
$\lim_{t\to\infty}\{f(t)\}$	$\lim_{s\to 0}\{sF(s)\}$