Laplace Transform Table

(Adapted from Table 5.1 of Kohler and Johnson)

Time Domain Function $f(t),\ t \geq 0$	Laplace Transform $F(s)$
a	$\frac{a}{s} \quad s > 0$
$h(t) = \begin{cases} 1, & t \geq 0 \\ 0, & t < 0 \end{cases}$	$\frac{1}{s} \qquad s > 0$
$t^n, \qquad n = 1, 2, 3...$	$\frac{n!}{s^{n+1}}, \qquad s > 0$
$e^{\alpha t}$	$\frac{1}{s-\alpha}, \qquad s > \alpha$
$\sin(\omega t)$	$\frac{\omega}{s^2+\omega^2}, \qquad s > 0$
$\cos(\omega t)$	$\frac{s}{s^2+\omega^2}, \qquad s > 0$
$\sinh(\alpha t)$	$\frac{\alpha}{s^2-\alpha^2}, \qquad s > \|\alpha\|$
$\cosh(\alpha t)$	$\frac{s}{s^2-\alpha^2}, \qquad s > \|\alpha\|$
$e^{\alpha t} f(t)$, with $\|f(t)\| \leq M e^{at}$	$F(s-\alpha), \qquad s > \alpha + a$
$e^{\alpha t} h(t)$	$\frac{1}{s-\alpha}, \qquad s > \alpha$
$e^{\alpha t} t^n, \qquad n = 1, 2, 3...$	$\frac{n!}{(s-\alpha)^{n+1}}, \qquad s > \alpha$
$e^{\alpha t} \sin(\omega t)$	$\frac{\omega}{(s-\alpha)^2+\omega^2}, \qquad s > \alpha$
$e^{\alpha t} \cos(\omega t)$	$\frac{(s-\alpha)}{(s-\alpha)^2+\omega^2}, \qquad s > \alpha$

Time Domain Function $f(t),\ t \geq 0$	Laplace Transform $F(s)$
$f(t-\alpha)h(t-\alpha), \quad \alpha \geq 0$ with $\lvert f(t)\rvert \leq Me^{at}$	$e^{-\alpha s}F(s), \quad s > a$
$h(t-\alpha), \quad \alpha \geq 0$	$\dfrac{e^{-\alpha s}}{s}, \quad s > 0$
$f'(t)$, with $f(t)$ continuous and $\lvert f'(t)\rvert \leq Me^{at}$	$sF(s) - f(0), \quad s > \max\{a, 0\}$
$f''(t)$, with $f'(t)$ continuous and $\lvert f''(t)\rvert \leq Me^{at}$	$s^2F(s) - sf(0) - f'(0), \quad s > \max\{a, 0\}$
$\int_0^t f(u)\, du$, with $\lvert f(t)\rvert \leq Me^{at}$	$\dfrac{F(s)}{s}, \quad s > \max\{a, 0\}$
$\dfrac{1}{2\omega^3}(\sin\omega t - \omega t\cos\omega t)$	$\dfrac{1}{(s^2+\omega^2)^2}, \quad s > 0$
$\dfrac{t}{2\omega}\sin\omega t$	$\dfrac{s}{(s^2+\omega^2)^2}, \quad s > 0$
$tf(t)$	$-F'(s)$