

Table of Laplace Transforms

In the following formulas $F(s) = \mathcal{L}[f(t)]$, so $f(t) = \mathcal{L}^{-1}[F(s)]$.

$$\text{For } a \in \mathbb{R}, u_a(t) = h(t-a) = \begin{cases} 0 & t < a \\ 1 & a \leq t \end{cases}.$$

$f(t)$	$F(s)$
t^n	$\frac{n!}{s^{n+1}}$
e^{at}	$\frac{1}{s-a}$
$\sin \beta t$	$\frac{\beta}{(s^2 + \beta^2)}$
$\cos \beta t$	$\frac{s}{(s^2 + \beta^2)}$
$e^{at} f(t)$	$F(s-a)$
$e^{at} t^n$	$\frac{n!}{(s-a)^{n+1}}$
$e^{at} \sin \beta t$	$\frac{\beta}{(s-a)^2 + \beta^2}$
$e^{at} \cos \beta t$	$\frac{(s-a)}{(s-a)^2 + \beta^2}$
$u_a(t)$	$\frac{e^{-as}}{s}$
$u_a(t)f(t-a) = h(t-a)f(t-a)$	$e^{-as}F(s)$
$f'(t)$	$sF(s) - f(0)$
$f^{(n)}(t)$	$s^n F(s) - s^{n-1}f(0) - s^{n-2}f'(0) - \dots - f^{(n-1)}(0)$
$tf(t)$	$-F'(s)$