

Short Table of Laplace Transforms

Entry number	$f(t) = \mathcal{L}^{-1}\{F(s)\}$	$F(s) = \mathcal{L}\{f(t)\}$
1	1	$\frac{1}{s}$
2	e^{at}	$\frac{1}{s-a}$
3	$t^n, n = 1, 2, \dots$	$\frac{n!}{s^{n+1}}$
4	$\sin(bt)$	$\frac{b}{s^2 + b^2}$
5	$\cos(bt)$	$\frac{s}{s^2 + b^2}$
6	$\sinh(bt)$	$\frac{b}{s^2 - b^2}$
7	$\cosh(bt)$	$\frac{s}{s^2 - b^2}$
8	$e^{at}t^n, n = 1, 2, \dots$	$\frac{n!}{(s-a)^{n+1}}$
9	$e^{at}\sin(bt)$	$\frac{b}{(s-a)^2 + b^2}$
10	$e^{at}\cos(bt)$	$\frac{s-a}{(s-a)^2 + b^2}$
11	$e^{at}f(t)$	$F(s-a)$
12	$f'(t)$	$sF(s) - f(0)$
13	$f''(t)$	$s^2F(s) - sf(0) - f'(0)$
14	$f^{(n)}(t)$	$s^nF(s) - s^{n-1}f(0) - \dots - f^{(n-1)}(0)$
15	$t^n f(t)$	$(-1)^n F^{(n)}(s)$
16	$f(t-a)u(t-a)$	$e^{-as}F(s)$
17	$u(t-a)$	$\frac{e^{-as}}{s}$
18	$\Pi_{a,b}(t)$	$\frac{e^{-as} - e^{-bs}}{s}$
19	$\int_0^t f(t-\tau)g(\tau)d\tau$	$F(s)G(s)$
20	$\delta(t-a)$	e^{-as}
21	$f(t)\delta(t-a)$	$f(a)e^{-as}$