

Table 1: Laplace Transform Table.

$f(t)$	$\mathcal{L}\{f(t)\}$
1	$\frac{1}{s}, s > 0$
e^{at}	$\frac{1}{s-a}, s > a$
t^n	$\frac{n!}{s^{n+1}}, s > 0$
$\sin at$	$\frac{a}{s^2+a^2}, s > 0$
$\cos at$	$\frac{s}{s^2+a^2}, s > 0$
$\sinh at$	$\frac{a}{s^2-a^2}, s > a $
$\cosh at$	$\frac{s}{s^2-a^2}, s > a $
$e^{at} \sin bt$	$\frac{b}{(s-a)^2+b^2}, s > a$
$e^{at} \cos bt$	$\frac{s-a}{(s-a)^2+b^2}, s > a$
$t^n e^{at}$	$\frac{n!}{(s-a)^{n+1}}, s > a$
$u_c(t)$	$\frac{e^{-cs}}{s}, s > 0$
$u_c(t)f(t-c)$	$e^{-cs}F(s)$
$\int_0^t f(t-\tau)g(\tau)d\tau$	$F(s)G(s)$
$\delta(t-c)$	e^{-cs}

Common integral formulas:

1. $\int \sin^2 u du = \frac{1}{2}u - \frac{1}{4} \sin 2u + C$
2. $\int \cos^2 u du = \frac{1}{2}u + \frac{1}{4} \sin 2u + C$
3. $\int u \cos u du = \cos u + u \sin u + C$
4. $\int u \sin u du = \sin u - u \cos u + C$
5. $\int e^{au} \sin bu du = \frac{e^{au}}{a^2+b^2}(a \sin bu - b \cos bu) + C$
6. $\int e^{au} \cos bu du = \frac{e^{au}}{a^2+b^2}(a \cos bu + b \sin bu) + C$