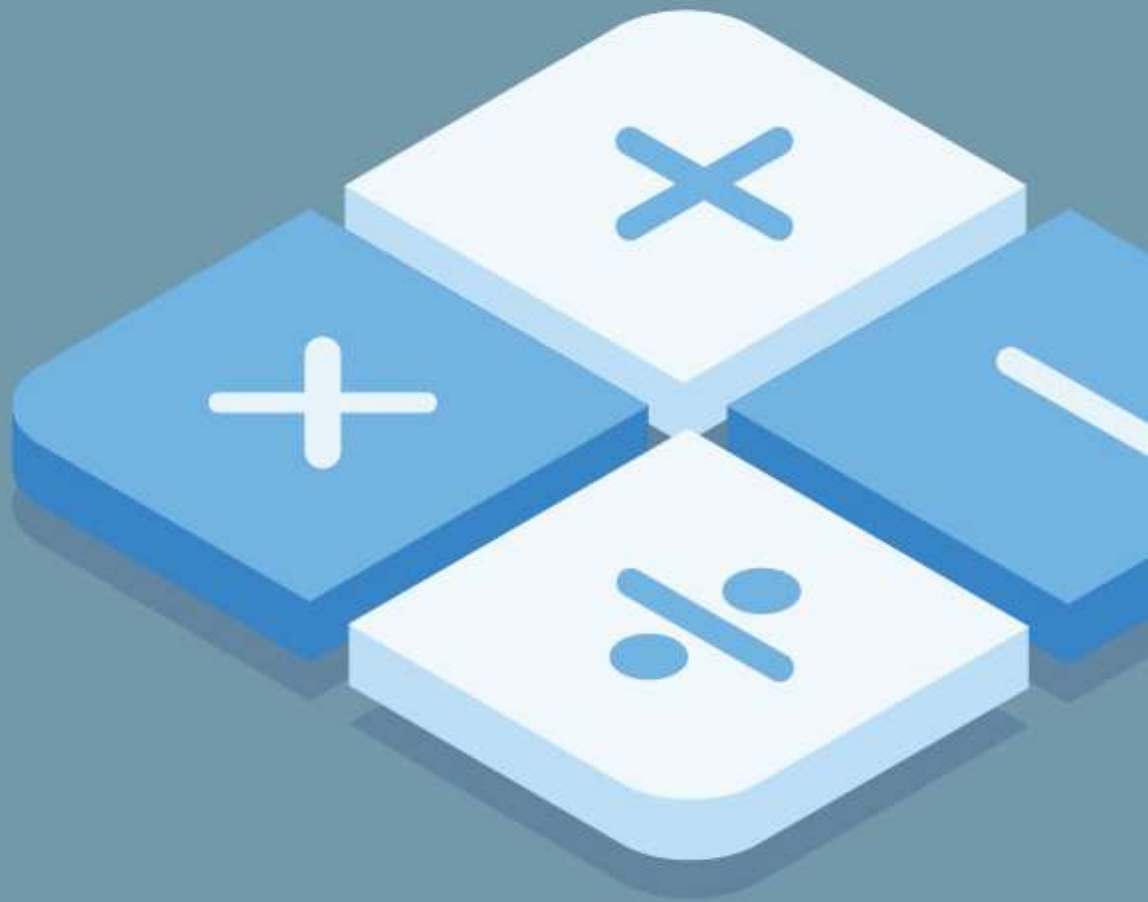


Common Laplace transforms



laplace-transform.com

The following **table summarizes common Laplace transforms** that can be used to solve different Laplace transform problems:

$f(t)$	$F(s) = \mathcal{L}\{f(t)\}$
1	$\frac{1}{s}$
t^n	$\frac{n!}{s^{n+1}}, \quad n \in \mathbb{Z}_+$
$\sin(bt)$	$\frac{b}{s^2 + b^2}$
$\cos(bt)$	$\frac{s}{s^2 + b^2}$
e^{at}	$\frac{1}{s - a}$
$t^n e^{at}$	$\frac{n!}{(s - a)^{n+1}}, \quad n \in \mathbb{Z}_+$
$e^{at} \sin(bt)$	$\frac{b}{(s - a)^2 + b^2}$
$e^{at} \cos(bt)$	$\frac{s - a}{(s - a)^2 + b^2}$
$f(t - a)u(t - a)$	$e^{-as}F(s)$
$e^{at} f(t)$	$F(s - a)$
$f'(t)$	$sF(s) - f(0)$
$f''(t)$	$s^2F(s) - sf'(0) - f(0)$
$f^{(n)}(t)$	$s^n F(s) - s^{(n-1)}f(0) - \dots - f^{(n-1)}(0)$
$t^n f(t)$	$(-1)^n \frac{d^n}{ds^n} F(s)$
$(f * g)(t)$	$F(s)G(s)$
$\int_0^t f(\tau) d\tau$	$\frac{1}{s} F(s)$
$f(at)$	$\frac{1}{a} F\left(\frac{s}{a}\right)$
f periodic with period T	$\frac{1}{1 - e^{-sT}} \int_0^T e^{-st} f(t) dt$