

Laplace Pairs

Electrical Engineering

The one-sided Laplace pairs that turn a differential equation into ordinary algebra.

One-sided transform, for $t \geq 0$, initial conditions at zero.

$f(t)$	$F(s)$
Unit step $u(t)$	$1/s$
Impulse $\delta(t)$	1
$\exp(-at)$	$1/(s + a)$
t	$1/s^2$
$\sin(\omega t)$	$\omega/(s^2 + \omega^2)$
$\cos(\omega t)$	$s/(s^2 + \omega^2)$
df/dt	$sF(s) - f(0)$

Differentiation becomes multiplication by s . That single substitution is the whole reason the transform is worth learning.