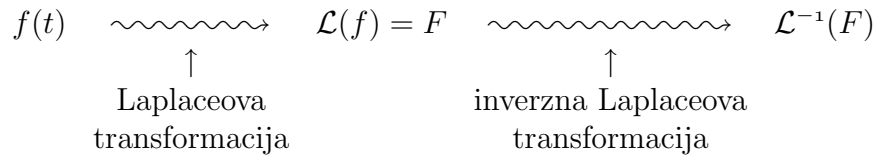


# LAPLACEOVA TRANSFORMACIJA

S pomočjo nekega integrala realni funkciji  $f$  priredimo neko novo funkcijo  $F$  kompleksne spremenljivke

$$F(s) = \int_0^{\infty} e^{-ts} f(t) dt$$

Postopek:



## LASTNOSTI:

1.  $\mathcal{L}(af(t) + bg(t)) = aF(s) + bG(s)$
2.  $\mathcal{L}(af(t)) = aF(s)$
3.  $\lim_{s \rightarrow \infty} F(s) = 0$

## TABELA:

$f(t)$	$F(s)$
1	$\frac{1}{s}$
$t$	$\frac{1}{s^2}$
$t^n ; n \in \mathbb{N}$	$\frac{n!}{s^{n+1}}$
$e^{at} ; a \in \mathbb{R}$	$\frac{1}{s-a}$
$t^n e^{-at}$	$\frac{n!}{(s+a)^{n+1}}$
$\sin \omega t$	$\frac{\omega}{\omega^2 + s^2}$
$\cos \omega t$	$\frac{s}{\omega^2 + s^2}$
$f(at)$	$\frac{1}{ a } F\left(\frac{s}{a}\right)$
$e^{at} f(t)$	$F(s-a)$
$f(t-a)$	$F(s)e^{-as}$
$tf(t)$	$-F'(s)$
$t^n f(t)$	$(-1)^n F^{(n)}(s)$
$f'(t)$	$sF(s) - f(0)$
$f''(t)$	$s^2 F(s) - sf(0) - f'(0)$
$f^{(n)}$	$s^n F(s) - s^{n-1} f(0) - \dots - f^{(n-1)}(0)$
$(f * g)(t) = \int_0^t f(u)g(t-u)du$	$F(s)G(s)$