

DEF: $F(s) = \int_0^{\infty} e^{-st} f(t) dt$, tks za koji vrijedi

$$1 \longleftrightarrow \frac{1}{s} \quad t \longleftrightarrow \frac{1}{s^2} \quad t^n \longleftrightarrow \frac{n!}{s^{n+1}} \quad e^{at} \longleftrightarrow \frac{1}{s-a}$$

$$\sin \omega t \longleftrightarrow \frac{\omega}{s^2 + \omega^2} \quad \cos \omega t \longleftrightarrow \frac{s}{s^2 + \omega^2}$$

SVOSTVA:

$$f(at) \longleftrightarrow \frac{1}{a} F\left(\frac{s}{a}\right)$$

$$e^{-at} f(t) \longleftrightarrow F(s+a) \quad \text{prigušivanje}$$

$$f(t-a)u(t-a) \longleftrightarrow e^{-as} F(s) \quad \text{pomak}$$

$$\text{integrirajući slike: } \int_0^t f(\tau) d\tau \longleftrightarrow \frac{F(s)}{s}$$

$$(-t^n) f(t) \longleftrightarrow F^{(n)}(s)$$

KONVOLUCIJA: $(f_1 * f_2)(t) = \int_0^t f_1(\tau) f_2(t-\tau) d\tau$

$$(f_1 * f_2)(t) \longleftrightarrow F_1(s) \cdot F_2(s)$$

vrijedi i komutativnost i asocijativnost

$$(f_1 * f_2)(t) = (f_2 * f_1)(t) \quad , \quad (f_1 * f_2) * f_3 = f_1 * (f_2 * f_3)$$

$$\begin{aligned} f'(t) &\longleftrightarrow sF(s) - f(0) \quad \text{derivacija u gornjem p.} \\ tf(t) &\longleftrightarrow -F'(s) \quad \text{deriv. u donjem području} \\ \frac{f(t)}{t} &\longleftrightarrow \int_s^{\infty} F(s) ds \quad \text{integrirajući slike} \end{aligned}$$