**Laplaceova transformacija**

| $f(t)$ | $\mathcal{L}(f(t)) = F(p)$ |
|---|---|
| $1$ | $\frac{1}{p}$, $\mathrm{Re}(p) > 0$ |
| $t^n, n \in \mathbb{N}$ | $\frac{n!}{p^{n+1}}$, $\mathrm{Re}(p) > 0$ |
| $t^\alpha, \alpha > -1$ | $\frac{\Gamma(\alpha+1)}{p^{n+1}}$, $\mathrm{Re}(p) > 0$ |
| $e^{\lambda t}$ | $\frac{1}{p-\lambda}$, $\mathrm{Re}(p) > \lambda$ |
| $\sin \omega t$ | $\frac{\omega}{p^2+\omega^2}$, $\mathrm{Re}(p) > 0$ |
| $\cos \omega t$ | $\frac{p}{p^2+\omega^2}$, $\mathrm{Re}(p) > 0$ |
| $\mathrm{sh}\, \omega t$ | $\frac{\omega}{p^2-\omega^2}$, $\mathrm{Re}(p) > \omega$ |
| $\mathrm{ch}\, \omega t$ | $\frac{p}{p^2-\omega^2}$, $\mathrm{Re}(p) > \omega$ |
| $Y_a(t) = \begin{cases} 0, \, t < a \\ 1, \, t \geq a \end{cases}$ | $\frac{e^{-ap}}{p}$, $\mathrm{Re}(p) > 0$ |

**Svojstva Laplaceove transformacije**

1. Linearnost: $\mathcal{L}(\lambda f + \mu g) = \lambda \mathcal{L}(f) + \mu \mathcal{L}(g)$
2. Deriviranje originala: $\mathcal{L}(f') = p\mathcal{L}(f) - f(0)$
3. Integriranje originala: : $\mathcal{L}\left(\int_0^t f(\tau)\, d\tau\right) = \frac{\mathcal{L}(f(t))}{p}$
4. Derivacija slike: $\mathcal{L}(-tf(t)) = (\mathcal{L}(f(t)))'$
5. Teorem prigušenja: ako je $\mathcal{L}(f(t)) = F(p)$, onda je $\mathcal{L}(e^{at} f(t)) = F(p-a)$
6. Teorem pomaka: ako je $\mathcal{L}(f(t)) = F(p)$, onda je $\mathcal{L}(f(t-b)) = e^{-bp} F(p)$