

## Tablica Laplasovih transformacija

	$F(s)$	$f(t)$
1.	$\frac{1}{s}$	1
2.	$\frac{1}{s^2}$	$t$
3.	$\frac{1}{s^n}, n \in \mathbb{N}$	$\frac{t^{n-1}}{(n-1)!}$
4.	$\frac{1}{s^n}, n > 0$	$\frac{t^{n-1}}{\Gamma(n)}$
5.	$\frac{1}{s-a}$	$e^{at}$
6.	$\frac{1}{(s-a)^n}, n \in \mathbb{N}$	$\frac{t^{n-1} e^{at}}{(n-1)!}$
7.	$\frac{1}{(s-a)^n}, n > 0$	$\frac{t^{n-1} e^{at}}{\Gamma(n)}$
8. <del>8.</del>	$\frac{1}{s^2+a^2}$	$\frac{\sin at}{a}$
9. <del>9.</del>	$\frac{s}{s^2+a^2}$	$\cos at$
10. <del>10.</del>	$\frac{1}{(s-b)^2+a^2}$	$\frac{e^{bt} \sin at}{a}$
11. <del>11.</del>	$\frac{s-b}{(s-b)^2+a^2}$	$e^{bt} \cos at$
12. <del>12.</del>	$\frac{1}{s^2-a^2}$	$\frac{\sinh at}{a}$
13. <del>13.</del>	$\frac{s}{s^2-a^2}$	$\cosh at$
14. <del>14.</del>	$\frac{1}{(s-b)^2-a^2}$	$\frac{e^{bt} \sinh at}{a}$
15. <del>15.</del>	$\frac{s-b}{(s-b)^2-a^2}$	$e^{bt} \cosh at$
	$\sqrt{\frac{1}{s}}$	<del>scribble</del> $t^{-\frac{1}{2}}$
16.	$\frac{s^2-a^2}{(s^2+a^2)^2}$	$t \cdot \cos at$
17.	$\frac{2as}{(s^2+a^2)^2}$	$t \cdot \sin at$



## Osobine Laplasove transformacije

1. Linearost  $\mathcal{L}[\alpha f(t) + \beta g(t)] = \alpha F(s) + \beta G(s)$ .
2. Sličnost  $\mathcal{L}[f(at)] = \frac{1}{a} F\left(\frac{s}{a}\right)$ ,  $a > 0$ .
3. Prigušivanje  $\mathcal{L}[e^{\alpha t} f(t)] = F(s - \alpha)$ .
4. Kašnjenje  $\mathcal{L}[f(t - a)] = e^{-as} F(s)$ ,  $a > 0$ .
5. Kašnjenje po parametru Ako je  $\mathcal{L}[f(t, x)] = F(s, x)$ , tada je
$$\mathcal{L}\left[\frac{\partial f(t, x)}{\partial x}\right] = \frac{\partial F(s, x)}{\partial x}$$
6. Izvod originala  $\mathcal{L}[f'(t)] = sF(s) - f(0^+)$ ,
$$\mathcal{L}[f^{(n)}(t)] = s^n F(s) - s^{n-1} f(0)^+ - \dots - f^{(n-1)}(0^+)$$
7. Izvod slike  $\mathcal{L}[-tf(t)] = F'(s)$ .
8. Integracija originala  $\mathcal{L}\left[\int_0^t f(u) du\right] = \frac{F(s)}{s}$ .
9. Integracija slike  $\mathcal{L}\left[\frac{f(t)}{t}\right] = \int_s^\infty F(u) du$ .
10. Proizvod originala  $\mathcal{L}[f(t)g(t)] = (F * G)(s)$ .
11. Proizvod slika  $\mathcal{L}[(f * g)(t)] = \mathcal{L}\left[\int_0^t f(u)g(t-u) du\right] = F(s)G(s)$ .

$$\mathcal{L}\{y'\} = s \cdot \mathcal{L}\{y\} - y(0)$$

$$\mathcal{L}\{y''\} = s^2 \mathcal{L}\{y\} - s \cdot y(0) - y'(0)$$