

Podstawowe transformaty Laplace'a

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

Najważniejsze własności transformaty Laplace'a

1. $\mathcal{L}[f(t)] = \int_0^\infty e^{-st} f(t) dt = F(s)$
2. $\mathcal{L}[f'(t)] = sF(s) - f(0)$
3. $\mathcal{L}[f''(t)] = s^2 F(s) - sf(0) - f'(0)$
4. $\mathcal{L}[f^{(n)}(t)] = s^n F(s) - s^{n-1} f(0) - s^{n-2} f'(0) - \dots - f^{(n-1)}(0)$
5. $\mathcal{L}[e^{at} f(t)] = F(s - a)$
6. $\mathcal{L}[t f(t)] = -F'(s)$
7. $\mathcal{L}[t^n f(t)] = (-1)^n F^{(n)}(s)$