MATEMATIKA IV

tabela Laplaceovih transformov

ver.:	2.4	datum:	2. 4. 2009

$\mathcal{L}\left\{f\left(t\right)\right\} = \int_0^\infty f\left(t\right)e^{-st}\,dt$

$\mathcal{L}\left\{f_1\left(t\right) + f_2\left(t\right)\right\} = \mathcal{L}\left\{f_1\left(t\right)\right\} + \mathcal{L}\left\{f_2\left(t\right)\right\} \qquad \mathcal{L}\left\{C \cdot f\left(t\right)\right\} = C \cdot \mathcal{L}\left\{f\left(t\right)\right\}$

$\int_0^t f\left(u\right)g\left(t-u\right)du \iff F\left(s\right) \cdot G\left(s\right)$*

$\mathcal{L}\left\{f\left(t\right)\right\} = \frac{1}{1-e^{-sT}}\int_0^T e^{-st}dt$**

$\mathcal{L}^{-1}\left\{\frac{1}{(s-a)^n}\right\} = e^{at}\mathcal{L}\left\{\frac{1}{s^n}\right\} = e^{at}\frac{t^{n-1}}{(n-1)!} \qquad n \in \mathbb{N}$***

$f\left(t\right) = \sum \underset{s=s_i}{res}\left[F\left(s\right)e^{st}\right]$****

f(t)	F(s)	
1	$\frac{1}{s}$	
t^n	$\frac{(n!)}{(s^{n+1})}$	$n \in \mathbb{N}$
t^α	$\frac{\Gamma(\alpha+1)}{s^{\alpha+1}}$	$\alpha > -1\,,\ \alpha \in \mathbb{R}$
$e^{\alpha t}$	$\frac{1}{s-a}$	
$\sin(at)$	$\frac{a}{s^2+a^2}$	
$\cos(at)$	$\frac{s}{s^2+a^2}$	

f(t)	F(s)
$f\left(at\right)$	$\frac{1}{a}F\left(\frac{s}{a}\right)$
$e^{at}f\left(t\right)$	$F\left(s-a\right)$
$u_a\left(t\right)f\left(t-a\right)$	$e^{-as}F\left(s\right)$
$f'\left(t\right)$	$sF\left(s\right) - f\left(0\right)$
$f^{(n)}\left(t\right)$	$s^n F\left(s\right) - s^{n-1}f\left(0\right) - s^{n-2}f'\left(0\right) - \ldots - f^{(n-1)}\left(0\right)$
$t\,f\left(t\right)$	$-F'\left(s\right)$
$t^n f\left(t\right)$	$\left(-1\right)^n F^{(n)}\left(s\right)$
$\int_0^t f\left(u\right)du$	$\frac{F(s)}{s}$
$\frac{f(t)}{t}$	$\int_s^\infty F\left(u\right)du$

* konvolucija
** za periodične funkcije
*** premik $F\left(S-a\right)$ ter transform $\frac{1}{s^n}$
**** kjer s_i singularnost $F\left(s\right)e^{st}$

Dopolnjena verzija z nekaterimi uporabnimi formulami in zvezami. Za razumevanje glej avditorne vaje. Vkolikor odkrijete napako oz. pomankljivost, pišite na stromar.si@gmail.com. lp!