Trasformate di Laplace di alcuni segnali notevoli

$\boldsymbol{f(t)}$	$\boldsymbol{\mathcal{L}[f(t)_+](s)}$	$\boldsymbol{\sigma[f]}$
1	$\frac{1}{s}$	0
e^{at}	$\frac{1}{s-a}$	$Re(a)$
$\sin\omega t\ ,\ \ \omega>0$	$\frac{\omega}{s^2+\omega^2}$	0
$\cos\omega t\ ,\ \ \omega>0$	$\frac{s}{s^2+\omega^2}$	0
$\sinh\omega t\ ,\ \ \omega>0$	$\frac{\omega}{s^2-\omega^2}$	ω
$\cosh\omega t\ ,\ \ \omega>0$	$\frac{s}{s^2-\omega^2}$	ω
$e^{at}\sin\omega t\ ,\ \ \omega>0$	$\frac{\omega}{(s-a)^2+\omega^2}$	$Re(a)$
$e^{at}\cos\omega t\ ,\ \ \omega>0$	$\frac{s-a}{(s-a)^2+\omega^2}$	$Re(a)$
$e^{at}\sin(\omega t+\ \phi)\ ,\ \ \omega>0$	$\frac{\omega\cos\phi+(s-a)\sin\phi}{(s-a)^2+\omega^2}$	$Re(a)$
$e^{at}\cos(\omega t+\ \phi)\ ,\ \ \omega>0$	$\frac{(s-a)\cos\phi-\omega\sin\phi}{(s-a)^2+\omega^2}$	$Re(a)$
$t^n\ ,\ \ n\in\mathbb{N}$	$\frac{n!}{s^{n+1}}$	0
$t^n\,e^{at}\ ,\ \ n\in\mathbb{N}$	$\frac{n!}{(s-a)^{n+1}}$	$Re(a)$
$t^\alpha\ ,\ \ \alpha>-1$	$\frac{\Gamma(\alpha+1)}{s^{\alpha+1}}$	0
$t\sin\omega t\ ,\ \ \omega>0$	$\frac{2s\omega}{(s^2+\omega^2)^2}$	0
$t\cos\omega t\ ,\ \ \omega>0$	$\frac{s^2-\omega^2}{(s^2+\omega^2)^2}$	0

$Riportiamo\ di\ seguito\ alcuni\ classici\ sviluppi$:

$$\frac{1}{1-z} = \sum_{n\geq 0} z^n \ , \quad |z| < 1$$

$$e^z = \sum_{n\geq 0} \frac{z^n}{n!} \ , \qquad z \in \mathbb{C}$$

$$\sin z = \sum_{n\geq 0} (-1)^n \frac{z^{2n+1}}{(2n+1)!} \ , \qquad z \in \mathbb{C}$$

$$\cos z = \sum_{n\geq 0} (-1)^n \frac{z^{2n}}{(2n)!} \ , \qquad z \in \mathbb{C}$$

$$\sinh z = \sum_{n\geq 0} \frac{z^{2n+1}}{(2n+1)!} \ , \qquad z \in \mathbb{C}$$

$$\cosh z = \sum_{n\geq 0} \frac{z^{2n}}{(2n)!} \ , \qquad z \in \mathbb{C}$$

$$\log(1+z) = \sum_{n\geq 0} (-1)^n \frac{z^{n+1}}{n+1} \ , \quad |z| < 1$$

$$\frac{1}{(1-z)^2} = \sum_{n\geq 1} n z^{n-1} = \sum_{n\geq 0} (n+1) z^n \ , \quad |z| < 1$$

$$\frac{1}{1+z^2} = \sum_{n\geq 0} (-1)^n z^{2n} \ , \quad |z| < 1$$

$$\arctan z = \textstyle\sum_{n\geq 0} (-1)^n \frac{z^{2n+1}}{2n+1} \ , \quad |z| < 1$$

(L’ultima funzione è l’arcotangente principale in campo complesso)