Tab. VI.3.2 Trasformate di Laplace

N°	Funzione $f(t)$ per $t \geq 0$	$L[f(t)]$
1	$\delta(t)$	1
2	$\delta(t-a)$	e^{-as}
3	$u_{-1}(t-a)$	$\frac{1}{s}e^{-as}$
4	$u_{-1}(t)-u_{-1}(t-a)$	$\frac{1}{s}(1-e^{-as})$
5	$tu_{-1}(t)$	$\frac{1}{s^2}$
6	$\frac{1}{(n-1)!}t^{n-1}$	$\frac{1}{s^n}$
7	e^{-at}	$\frac{1}{s+a}$
8	$\frac{1}{(n-1)!}t^{n-1}e^{-at}$	$\frac{1}{(s+a)^n}$
9	$\frac{1}{a}(1-e^{-at})$	$\frac{1}{s(s+a)}$ —
10	$\frac{1}{ab}\left(1-\frac{b}{b-a}e^{-at}+\frac{a}{b-a}e^{-bt}\right)$	$\frac{1}{s(s+a)(s+b)}$
11	$\frac{1}{ab}\left[\alpha-\frac{b(\alpha-a)}{b-a}e^{-at}+\frac{a(\alpha-b)}{b-a}e^{-bt}\right]$	$\frac{s+\alpha}{s(s+a)(s+b)}$
12	$\frac{1}{b-a}(e^{-at}-e^{-bt})$	$\frac{1}{(s+a)(s+b)}$
13	$\frac{1}{a-b}(ae^{-at}-be^{-bt})$	$\frac{s}{(s+a)(s+b)}$
14	$\frac{1}{b-a}[(\alpha-a)e^{-at}-(\alpha-b)e^{-bt}]$	$\frac{s\quad\alpha}{(s+a)(s+b)}$
15	$\frac{e^{-at}}{(b-a)(c-a)}+\frac{e^{-bt}}{(c-b)(a-b)}+\frac{e^{-ct}}{(a-c)(b-c)}$	$\frac{1}{(s+a)(s+b)(s+c)}$
16	$\frac{(\alpha-a)e^{-at}}{(b-a)(c-a)}+\frac{(\alpha-b)e^{-bt}}{(c-b)(a-b)}+\frac{(\alpha-c)e^{-ct}}{(a-c)(b-c)}$	$\frac{s\quad\alpha}{(s+a)(s+b)(s+c)}$
17	$\frac{1}{a^2}(at-1+e^{-at})$	$\frac{1}{s^2(s+a)}$
18	$\frac{1}{a^2}(1-e^{-at}-ate^{-at})$	$\frac{1}{s(s+a)^2}$
19	$\frac{1}{a^2}[\alpha-\alpha e^{-at}+a(a-\alpha)te^{-at}]$	$\frac{s+\alpha}{s(s+a)^2}$
20	$\frac{\alpha_0}{ab}-\frac{a^2-\alpha_1 a+\alpha_0}{a(a-b)}e^{-at}-\frac{b^2-\alpha_1 b+\alpha_0}{b(a-b)}e^{-bt}$	$\frac{s^2+\alpha_1 s+\alpha_0}{s(s+a)(s+b)}$
21	$\frac{\alpha_1+\alpha_0 t}{ab}-\frac{\alpha_0(a+b)}{(ab)^2}-\frac{1}{a-b}\left(1-\frac{\alpha_1}{a}+\frac{\alpha_0}{a^2}\right)e^{-at}-$ $-\frac{1}{b-a}\left(1-\frac{\alpha_1}{b}+\frac{\alpha_0}{b^2}\right)e^{-bt}$	$\frac{s^2+\alpha_1 s+\alpha_0}{s^2(s+a)(s+b)}$
22	$\sin\omega t$	$\frac{\omega}{s^2+\omega^2}$
23	$\cos\omega t$	$\frac{s}{s^2+\omega^2}$
24	$\frac{\sqrt{\alpha^2+\omega^2}}{\omega}\sin(\omega t+\theta)$ $\theta=\operatorname{arc\,tg}\frac{\omega}{\alpha}$	$\frac{s+\alpha}{s^2+\omega^2}$
25	$\sin(\omega t+\theta)=\cos[\omega t+(\theta-90°)]$	$\frac{s\sin\theta+\omega\cos\theta}{s^2+\omega^2}$
26	$\frac{1}{\omega^2}(1-\cos\omega t)$	$\frac{1}{s(s^2+\omega^2)}$

Tab. VI.3.2. (*segue*)

N°	Funzione $f(t)$ per $t \geq 0$	$L[f(t)]$
27	$\frac{\alpha}{\omega^2} - \frac{\sqrt{\alpha^2+\omega^2}}{\omega^2}\cos(\omega t+\theta)$ $\theta = \operatorname{arc\,tg}\frac{\omega}{\alpha}$	$\frac{s+\alpha}{s(s^2+\omega^2)}$
28	$\frac{e^{-at}}{a^2+\omega^2} + \frac{1}{\omega\sqrt{a^2+\omega^2}}\sin(\omega t-\theta)$ $\theta = \operatorname{arc\,tg}\frac{\omega}{a}$	$\frac{1}{(s+a)(s^2+\omega^2)}$
29	$\frac{1}{b}e^{-at}\sin bt$	$\frac{1}{(s+a)^2+b^2}$
30	$\frac{1}{\omega_n\sqrt{1-\zeta^2}}e^{-\zeta\omega_n t}\sin\sqrt{1-\zeta^2}\,\omega_n t$	$\frac{1}{s^2+2\zeta\omega_n s+\omega_n^2}$
31	$e^{-at}\cos bt$	$\frac{s+a}{(s+a)^2+b^2}$
32	$\frac{\sqrt{(\alpha-a)^2+b^2}}{b}e^{-at}\sin(bt+\theta)$ $\theta = \operatorname{arc\,tg}\frac{b}{\alpha-a}$	$\frac{s+\alpha}{(s+a)^2+b^2}$
33	$\frac{1}{a^2+b^2} + \frac{1}{b\sqrt{a^2+b^2}}e^{-at}\sin(bt-\theta)$ $\theta = \operatorname{arc\,tg}\frac{b}{-a}$	$\frac{1}{s[(s+a)^2+b^2]}$
34	$\frac{1}{\omega_n^2} - \frac{1}{\omega_n^2\sqrt{1-\zeta^2}}e^{-\zeta\omega_n t}\sin(\omega_n\sqrt{1-\zeta^2}\,t+\theta)$ $\theta = \arccos\zeta$	$\frac{1}{s(s^2+2\zeta\omega_n s+\omega_n^2)}$
35	$\frac{\alpha}{a^2+b^2} + \frac{1}{b}\sqrt{\frac{(\alpha-a)^2+b^2}{a^2+b^2}}\,e^{-at}\sin(bt+\theta)$ $\theta = \operatorname{arc\,tg}\frac{b}{\alpha-a} - \operatorname{arc\,tg}\frac{b}{-a}$	$\frac{s+\alpha}{s[(s+a)^2+b^2]}$
36	$\frac{e^{-at}}{(c-a)^2+b^2} + \frac{e^{-at}\sin(bt-\theta)}{b\sqrt{(c-a)^2+b^2}}$ $\theta = \operatorname{arc\,tg}\frac{b}{c-a}$	$\frac{1}{(s+c)[(s+a)^2+b^2]}$
37	$\frac{1}{c(a^2+b^2)} - \frac{e^{-ct}}{c[(c-a)^2+b^2]} +$ $+\frac{e^{-at}\sin(bt-\theta)}{b\sqrt{a^2+b^2}\sqrt{(c-a)^2+b^2}}$ $\theta = \operatorname{arc\,tg}\frac{b}{-a} + \operatorname{arc\,tg}\frac{b}{c-a}$	$\frac{1}{s(s+c)[(s+a)^2+b^2]}$
38	$\frac{\alpha}{c(a^2+b^2)} + \frac{(c-\alpha)e^{-ct}}{c[(c-a)^2+b^2]} +$ $+\frac{\sqrt{(\alpha-a)^2+b^2}}{b\sqrt{a^2+b^2}\sqrt{(c-a)^2+b^2}}e^{-at}\sin(bt+\theta)$ $\theta = \operatorname{arc\,tg}\frac{b}{\alpha-a} - \operatorname{arc\,tg}\frac{b}{-a} - \operatorname{arc\,tg}\frac{b}{c-a}$	$\frac{s+\alpha}{s(s+c)[(s+a)^2+b^2]}$

$2ke^{-at}\cos(bt+\theta)$ $\qquad \frac{k \quad \angle\theta}{s+(a+jb)} + \frac{k \quad \angle-\theta}{s+(a-jb)}$