FORMULARIO

S-192

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Función $f(t)$	Transformada de Laplace $\mathcal{L}\{f(t)\} = F(s)$	Sustitución
1	$\mathcal{L}\{1\}$	$\frac{1}{s}$
t	$\mathcal{L}\{t\}$	$\frac{1}{s^2}$
t^2	$\mathcal{L}\{t^2\}$	$\frac{2}{s^3}$
t^n	$\mathcal{L}\{t^n\}$	$\frac{n!}{s^{n+1}}$
e^{at}	$\mathcal{L}\{e^{at}\}$	$\frac{1}{s-a}$
$\cos(bt)$	$\mathcal{L}\{\cos(bt)\}$	$\frac{s}{s^2+b^2}$
$\sin(bt)$	$\mathcal{L}\{\sin(bt)\}$	$\frac{b}{s^2+b^2}$
$\sinh(bt)$	$\mathcal{L}\{\sinh(bt)\}$	$\frac{b}{s^2-b^2}$
$\cosh(bt)$	$\mathcal{L}\{\cosh(bt)\}$	$\frac{s}{s^2-b^2}$
$e^{at}\cos(bt)$	$\mathcal{L}\{e^{at}\cos(bt)\}$	$\frac{s-a}{(s-a)^2+b^2}$
$e^{at}\sin(bt)$	$\mathcal{L}\{e^{at}\sin(bt)\}$	$\frac{b}{(s-a)^2+b^2}$
$\delta(t-a)$	$\mathcal{L}\{\delta(t-a)\}$	e^{-as}
$u(t-a)$	$\mathcal{L}\{u(t-a)\}$	$\frac{e^{-as}}{s}$
$\frac{1}{t}$	$\mathcal{L}\{\frac{1}{t}\}$	$\ln(s)$
te^{at}	$\mathcal{L}\{te^{at}\}$	$\frac{1}{(s-a)^2}$
$t^n e^{at}$	$\mathcal{L}\{t^n e^{at}\}$	$\frac{n!}{(s-a)^{n+1}}$
$\sinh(at)\cosh(bt)$	$\mathcal{L}\{\sinh(at)\cosh(bt)\}$	$\frac{a}{s^2-(a+b)^2} - \frac{a}{s^2-(a-b)^2}$
$\cosh(at)\sinh(bt)$	$\mathcal{L}\{\cosh(at)\sinh(bt)\}$	$\frac{s}{s^2-(a+b)^2} - \frac{s}{s^2-(a-b)^2}$
$\int_0^t f(\tau)d\tau$	$\mathcal{L}\{\int_0^t f(\tau)d\tau\}$	$\frac{F(s)}{s}$

$f'(t)$	$\mathcal{L}\{f'(t)\}$	$sF(s) - f(0)$
$f''(t)$	$\mathcal{L}\{f''(t)\}$	$s^2F(s) - sf(0) - f'(0)$
$e^{bt}t^n$	$\mathcal{L}\{e^{bt}t^n\}$	$\frac{n!}{(s-b)^{n+1}}$
$t\sin(at)$	$\mathcal{L}\{t\sin(at)\}$	$\frac{2as}{(s^2+a^2)^2}$
$t\cos(at)$	$\mathcal{L}\{t\cos(at)\}$	$\frac{s^2-a^2}{(s^2+a^2)^2}$
$\sin(at+b)$	$\mathcal{L}\{\sin(at+b)\}$	$\frac{a\cos(b)+s\sin(b)}{s^2+a^2}$
$\cos(at+b)$	$\mathcal{L}\{\cos(at+b)\}$	$\frac{s\cos(b)-a\sin(b)}{s^2+a^2}$
$\sinh(at)$	$\mathcal{L}\{\sinh(at)\}$	$\frac{a}{s^2-a^2}$
$\cosh(at)$	$\mathcal{L}\{\cosh(at)\}$	$\frac{s}{s^2-a^2}$
$u(t)\cos(at)$	$\mathcal{L}\{u(t)\cos(at)\}$	$\frac{s}{s^2+a^2}$
$u(t)\sin(at)$	$\mathcal{L}\{u(t)\sin(at)\}$	$\frac{a}{s^2+a^2}$
$u(t)\cosh(bt)$	$\mathcal{L}\{u(t)\cosh(bt)\}$	$\frac{s}{s^2-b^2}$
$u(t)\sinh(bt)$	$\mathcal{L}\{u(t)\sinh(bt)\}$	$\frac{b}{s^2-b^2}$
$u(t-a)\cos(b(t-a))$	$\mathcal{L}\{u(t-a)\cos(b(t-a))\}$	$\frac{e^{-as}(s\cos(b)+a\sin(b))}{s^2+b^2}$
$u(t-a)\sin(b(t-a))$	$\mathcal{L}\{u(t-a)\sin(b(t-a))\}$	$\frac{e^{-as}b}{s^2+b^2}$
$u(t-a)\cos(bt)$	$\mathcal{L}\{u(t-a)\cos(bt)\}$	$\frac{e^{-as}s}{s^2+b^2}$
$u(t-a)\sin(bt)$	$\mathcal{L}\{u(t-a)\sin(bt)\}$	$\frac{e^{-as}b}{s^2+b^2}$
t^ne^{-at}	$\mathcal{L}\{t^ne^{-at}\}$	$\frac{n!}{(s+a)^{n+1}}$
$e^{-at}\cosh(bt)$	$\mathcal{L}\{e^{-at}\cosh(bt)\}$	$\frac{s+a}{(s+a)^2-b^2}$
$e^{-at}\sinh(bt)$	$\mathcal{L}\{e^{-at}\sinh(bt)\}$	$\frac{b}{(s+a)^2-b^2}$

$te^{-at}\cos(bt)$	$\mathcal{L}\{te^{-at}\cos(bt)\}$	$\frac{s+a}{(s+a)^2+b^2}$
$te^{-at}\sin(bt)$	$\mathcal{L}\{te^{-at}\sin(bt)\}$	$\frac{b}{(s+a)^2+b^2}$
$e^{bt}\cos(at)$	$\mathcal{L}\{e^{bt}\cos(at)\}$	$\frac{s-b}{(s-b)^2+a^2}$
$e^{bt}\sin(at)$	$\mathcal{L}\{e^{bt}\sin(at)\}$	$\frac{a}{(s-b)^2+a^2}$
$t^m e^{bt}$	$\mathcal{L}\{t^m e^{bt}\}$	$\frac{m!}{(s-b)^{m+1}}$
$t^m e^{-bt}$	$\mathcal{L}\{t^m e^{-bt}\}$	$\frac{m!}{(s+b)^{m+1}}$
$e^{-bt}\cos(at)$	$\mathcal{L}\{e^{-bt}\cos(at)\}$	$\frac{s+b}{(s+b)^2+a^2}$
$e^{-bt}\sin(at)$	$\mathcal{L}\{e^{-bt}\sin(at)\}$	$\frac{a}{(s+b)^2+a^2}$
$e^{-bt}\cosh(at)$	$\mathcal{L}\{e^{-bt}\cosh(at)\}$	$\frac{s+b}{(s+b)^2-a^2}$
$e^{-bt}\sinh(at)$	$\mathcal{L}\{e^{-bt}\sinh(at)\}$	$\frac{a}{(s+b)^2-a^2}$
$\cos(at)\sin(bt)$	$\mathcal{L}\{\cos(at)\sin(bt)\}$	$\frac{s^2-a^2}{(s^2+a^2)^2} - \frac{a}{(s^2+b^2)^2}$
$\sin(at)\cos(bt)$	$\mathcal{L}\{\sin(at)\cos(bt)\}$	$\frac{ab}{(s^2+(a+b)^2)(s^2+(a-b)^2)}$
$\cos(at)$	$\mathcal{L}\{\cos(at)\}$	$\frac{s}{s^2+a^2}$
$\sin(at)$	$\mathcal{L}\{\sin(at)\}$	$\frac{a}{s^2+a^2}$
$\cosh(at)$	$\mathcal{L}\{\cosh(at)\}$	$\frac{s}{s^2-a^2}$
$\sinh(at)$	$\mathcal{L}\{\sinh(at)\}$	$\frac{a}{s^2-a^2}$
$u(t)\cos(at)$	$\mathcal{L}\{u(t)\cos(at)\}$	$\frac{s}{s^2+a^2}$
$u(t)\sin(at)$	$\mathcal{L}\{u(t)\sin(at)\}$	$\frac{a}{s^2+a^2}$
$u(t)\cosh(at)$	$\mathcal{L}\{u(t)\cosh(at)\}$	$\frac{s}{s^2-a^2}$
$u(t)\sinh(at)$	$\mathcal{L}\{u(t)\sinh(at)\}$	$\frac{a}{s^2-a^2}$
$u(t-a)\cosh(bt)$	$\mathcal{L}\{u(t-a)\cosh(bt)\}$	$\frac{e^{-as}s}{s^2-b^2}$
$u(t-a)\sinh(bt)$	$\mathcal{L}\{u(t-a)\sinh(bt)\}$	$\frac{e^{-as}b}{s^2-b^2}$

$u(t-a)\cos(bt)$	$\mathcal{L}\{u(t-a)\cos(bt)\}$	$\frac{e^{-as}s}{s^2+b^2}$
$u(t-a)\sin(bt)$	$\mathcal{L}\{u(t-a)\sin(bt)\}$	$\frac{e^{-as}b}{s^2+b^2}$
$t^n e^{-at}$	$\mathcal{L}\{t^n e^{-at}\}$	$\frac{n!}{(s+a)^{n+1}}$
$te^{-at}\cos(bt)$	$\mathcal{L}\{te^{-at}\cos(bt)\}$	$\frac{s+a}{(s+a)^2+b^2}$
$te^{-at}\sin(bt)$	$\mathcal{L}\{te^{-at}\sin(bt)\}$	$\frac{b}{(s+a)^2+b^2}$
$e^{bt}\cos(at)$	$\mathcal{L}\{e^{bt}\cos(at)\}$	$\frac{s-b}{(s-b)^2+a^2}$
$e^{bt}\sin(at)$	$\mathcal{L}\{e^{bt}\sin(at)\}$	$\frac{a}{(s-b)^2+a^2}$
$t^m e^{bt}$	$\mathcal{L}\{t^m e^{bt}\}$	$\frac{m!}{(s-b)^{m+1}}$
$t^m e^{-bt}$	$\mathcal{L}\{t^m e^{-bt}\}$	$\frac{m!}{(s+b)^{m+1}}$
$e^{-bt}\cos(at)$	$\mathcal{L}\{e^{-bt}\cos(at)\}$	$\frac{s+b}{(s+b)^2+a^2}$
$e^{-bt}\sin(at)$	$\mathcal{L}\{e^{-bt}\sin(at)\}$	$\frac{a}{(s+b)^2+a^2}$
$e^{-bt}\cosh(at)$	$\mathcal{L}\{e^{-bt}\cosh(at)\}$	$\frac{s+b}{(s+b)^2-a^2}$
$e^{-bt}\sinh(at)$	$\mathcal{L}\{e^{-bt}\sinh(at)\}$	$\frac{a}{(s+b)^2-a^2}$
$\cos(at)\sin(bt)$	$\mathcal{L}\{\cos(at)\sin(bt)\}$	$\frac{s^2-a^2}{(s^2+a^2)^2} - \frac{a}{(s^2+b^2)^2}$
$\sin(at)\cos(bt)$	$\mathcal{L}\{\sin(at)\cos(bt)\}$	$\frac{ab}{(s^2+(a+b)^2)(s^2+(a-b)^2)}$
$\cos(at)$	$\mathcal{L}\{\cos(at)\}$	$\frac{s}{s^2+a^2}$
$\sin(at)$	$\mathcal{L}\{\sin(at)\}$	$\frac{a}{s^2+a^2}$
$\cosh(at)$	$\mathcal{L}\{\cosh(at)\}$	$\frac{s}{s^2-a^2}$
$\sinh(at)$	$\mathcal{L}\{\sinh(at)\}$	$\frac{a}{s^2-a^2}$
$u(t)\cos(at)$	$\mathcal{L}\{u(t)\cos(at)\}$	$\frac{s}{s^2+a^2}$
$u(t)\sin(at)$	$\mathcal{L}\{u(t)\sin(at)\}$	$\frac{a}{s^2+a^2}$
$u(t)\cosh(at)$	$\mathcal{L}\{u(t)\cosh(at)\}$	$\frac{s}{s^2-a^2}$
$u(t)\sinh(at)$	$\mathcal{L}\{u(t)\sinh(at)\}$	$\frac{a}{s^2-a^2}$
$u(t-a)\cosh(bt)$	$\mathcal{L}\{u(t-a)\cosh(bt)\}$	$\frac{e^{-as}s}{s^2-b^2}$
$u(t-a)\sinh(bt)$	$\mathcal{L}\{u(t-a)\sinh(bt)\}$	$\frac{e^{-as}b}{s^2-b^2}$
$\cos(at)\sin(bt)$	$\mathcal{L}\{\cos(at)\sin(bt)\}$	$\frac{ab}{(s^2+(a+b)^2)-(s^2+(a-b)^2)}$
$\sin(at)\cos(bt)$	$\mathcal{L}\{\sin(at)\cos(bt)\}$	$\frac{s(a^2-b^2)}{(s^2+a^2)(s^2+b^2)}$