

TABLE OF LAPLACE TRANSFORMS

<u>function $f(t)$</u>	<u>transform $F(s)$</u>
t^n	$n!/s^{n+1}$
e^{at}	$1/(s - a)$
$\sin at$	$\frac{a}{a^2 + s^2}$
$\cos at$	$\frac{s}{a^2 + s^2}$
$\sinh at$	$\frac{a}{s^2 - a^2}$
$\cosh at$	$\frac{s}{s^2 - a^2}$
$u(t)e^{at}$	$U(s - a)$
$H(t - a)u(t - a)$	$e^{-as}U(s)$
$1 - \operatorname{erf}\left(a/\sqrt{4t}\right)$	$e^{-a\sqrt{s}}/s$
$\frac{e^{-a^2/(4t)}}{\sqrt{t}}$	$\sqrt{\pi/s} e^{-a\sqrt{s}}$
$\frac{ae^{-a^2/(4t)}}{\sqrt{4t^3}}$	$\sqrt{\pi} e^{-a\sqrt{s}}$
$u^{(n)}(t)$	$s^n U(s) - s^{n-1}u(0) - s^{n-2}u'(0) - \dots - u^{(n-1)}(0)$
$(u * v)(t)$	$U(s)V(s)$
$tu(t)$	$-U'(s)$
$u(t)/t$	$\int_s^\infty U(r) dr$
$u(at)$	$U(s/a)/a$
$\delta(t - a)$	e^{-as}

TABLE OF FOURIER TRANSFORMS

function $f(x)$	transform $\hat{f}(k) := \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} f(x)e^{-ikx} dx$
1	$\sqrt{2\pi} \delta(k)$
$\delta(x - a)$	$\frac{1}{\sqrt{2\pi}} e^{-iak}$
$\sigma(x)$	$\sqrt{\frac{\pi}{2}} \delta(k) - \frac{i}{k\sqrt{2\pi}}$
$\text{sign}(x)$	$-\frac{i}{k} \sqrt{\frac{2}{\pi}}$
$\sigma(a - x)$	$\sqrt{\frac{2}{\pi}} \frac{\sin(ak)}{k}$
$\sigma(x + a) - \sigma(x - a)$	$\sqrt{\frac{2}{\pi}} \frac{\sin(ak)}{k}$
$2\sigma(x) - \sigma(x + a) - \sigma(x - a)$	$-4i\sqrt{\frac{2}{\pi}} \frac{\sin^2(ak/2)}{k}$
$e^{-ax}\sigma(x)$	$\frac{1}{(a + ik)\sqrt{2\pi}}$
$e^{-ax}[1 - \sigma(x)]$	$\frac{1}{(a - ik)\sqrt{2\pi}}$
$e^{-b x }$	$\sqrt{\frac{2}{\pi}} \frac{b}{b^2 + k^2}$
$\arctan x$	$-i\sqrt{\frac{\pi}{2}} \frac{e^{- k }}{k} + \frac{\pi^{3/2}}{\sqrt{2}} \delta(k)$
$\frac{b}{b^2 + x^2}$	$\sqrt{\frac{\pi}{2}} e^{-b k }$
e^{-ax^2}	$\frac{1}{\sqrt{2a}} e^{-k^2/(4a)}$
$u^{(n)}(x)$	$(ik)^n \hat{u}(k)$
$\int_{-\infty}^x u(y) dy$	$-\frac{i}{k} \hat{u}(k) + \pi \hat{u}(0) \delta(k)$
$(u * v)(x) := \int_{-\infty}^{\infty} u(x - \xi)v(\xi) d\xi$	$\sqrt{2\pi} \hat{u}(k) \hat{v}(k)$
$xu(x)$	$i \frac{d}{dk} \hat{u}(k)$
$u(ax)$	$\frac{1}{ a } \hat{u}(k/a)$
$u(x - a)$	$e^{-ika} \hat{u}(k)$
$e^{iax}u(x)$	$\hat{u}(k - a)$
$\hat{u}(x)$	$u(-k)$