MATH 302: LAPLACE TRANSFORMS

All functions in the time domain here are defined on $0 \leq t < \infty$.

$f(t)$	$\mathcal{L}[f]$	converges when
1	$\frac{1}{s}$	$s > 0$
t	$\frac{1}{s^2}$	$s > 0$
t^n	$\frac{n!}{s^{n+1}}$	$s > 0$
t^α	$\frac{\Gamma(\alpha+1)}{s^{\alpha+1}}$	$s > 0$, $\alpha > -1$
e^{at}	$\frac{1}{s-a}$	$s > a$
$t^n e^{at}$	$\frac{n!}{(s-a)^{n+1}}$	$s > a$
$\sin(bt)$	$\frac{b}{s^2+b^2}$	$s > 0$
$\cos(bt)$	$\frac{s}{s^2+b^2}$	$s > 0$
$t\sin(bt)$	$\frac{2bs}{(s^2+b^2)^2}$	$s > 0$
$t\cos(bt)$	$\frac{s^2-b^2}{(s^2+b^2)^2}$	$s > 0$
$e^{at}\sin(bt)$	$\frac{b}{(s-a)^2+b^2}$	$s > a$
$e^{at}\cos(bt)$	$\frac{s-a}{(s-a)^2+b^2}$	$s > a$