Appendix D

Table of Laplace Transforms

Here a and b are real numbers, and the transforms will exist for sufficiently large s.

Function $\rightarrow$ **Transform**	**Function** $\rightarrow$ **Transform**
$f(t) \quad \rightarrow \quad F(s)$	$t^a \quad \rightarrow \quad \Gamma(a+1)/s^{a+1}$
$f'(t) \quad \rightarrow \quad sF(s) - f(0)$	$e^{at} \quad \rightarrow \quad 1/(s-a)$
$f''(t) \quad \rightarrow \quad s^2F(s) - sf(0) - f'(0)$	$t^n e^{at} \quad \rightarrow \quad n!/(s-a)^{n+1}$
$\int_0^t f(\tau)\,d\tau \quad \rightarrow \quad F(s)/s$	$\cos bt \quad \rightarrow \quad s/(s^2+b^2)$
$e^{at}f(t) \quad \rightarrow \quad F(s-a)$	$\sin bt \quad \rightarrow \quad b/(s^2+b^2)$
$u(t-a)f(t-a) \quad \rightarrow \quad e^{-as}F(s)$	$\cosh bt \quad \rightarrow \quad s/(s^2-b^2)$
$\int_0^t f(\tau)g(t-\tau)d\tau \quad \rightarrow \quad F(s)G(s)$	$\sinh bt \quad \rightarrow \quad b/(s^2-b^2)$
$tf(t) \quad \rightarrow \quad -F'(s)$	$e^{at}\cos bt \quad \rightarrow \quad (s-a)/((s-a)^2+b^2)$
$f(t)/t \quad \rightarrow \quad \int_s^\infty F(\sigma)d\sigma$	$e^{at}\sin bt \quad \rightarrow \quad b/((s-a)^2+b^2)$
$1 \quad \rightarrow \quad 1/s$	$u(t-a) \quad \rightarrow \quad e^{-as}/s$
$t^n \quad \rightarrow \quad n!/s^{n+1}$	$\delta(t-a) \quad \rightarrow \quad e^{-as}$