Formulas Sheet	
Function	**Laplace transform**
$\mathbf{f(t)}$	$\mathscr{L}\{\mathbf{f(t)}\} = \mathbf{F(s)}$
1	$\dfrac{1}{s}$
t^n	$\dfrac{n!}{s^{n+1}}$, (n is a positive integer)
$\sin kt$	$\dfrac{k}{s^2 + k^2}$
$\cos kt$	$\dfrac{s}{s^2 + k^2}$
$t \sin kt$	$\dfrac{2ks}{(s^2 + k^2)^2}$
$t \cos kt$	$\dfrac{s^2 - k^2}{(s^2 + k^2)^2}$
e^{at}	$\dfrac{1}{s - a}$
$t^n e^{at}$	$\dfrac{n!}{(s - a)^{n+1}}$, (n is a positive integer)
$e^{at} \sin kt$	$\dfrac{k}{(s - a)^2 + k^2}$
$e^{at} \cos kt$	$\dfrac{s - a}{(s - a)^2 + k^2}$
$e^{at} f(t)$	$F(s - a)$
$\mathscr{U}(t - a)$	$\dfrac{e^{-as}}{s}$, $\quad a \geq 0$
$f(t - a)\mathscr{U}(t - a)$	$e^{-as} F(s)$, $\quad a \geq 0$
$g(t)\mathscr{U}(t - a)$	$e^{-as} \mathscr{L}\{g(t + a)\}$, $\quad a \geq 0$
$f^{(n)}(t)$	$s^n F(s) - s^{n-1} f(0) - s^{n-2} f'(0) - \cdots - f^{(n-1)}(0)$
$\delta(t)$	1
$\delta(t - a)$	e^{-as}, $\quad a \geq 0$