LAPLACE TRANSFORM TABLE

$f(t) = \mathcal{L}^{-1}\{F(s)\}(t)$		$F(s) = \mathcal{L}\{f(t)\}(s) = \int_0^\infty e^{-st} f(t)\,dt$	
1		$\frac{1}{s}$,	$s > 0$
t^n ,	n an integer	$\frac{n!}{s^{n+1}}$,	$s > 0$
e^{at}		$\frac{1}{s-a}$,	$s > a$
$\sin bt$		$\frac{b}{s^2+b^2}$,	$s > 0$
$\cos bt$		$\frac{s}{s^2+b^2}$,	$s > 0$
$e^{at} f(t)$		$F(s-a)$	
$e^{at} t^n$	n an integer	$\frac{n!}{(s-a)^{n+1}}$,	$s > a$
$e^{at} \sin bt$		$\frac{b}{(s-a)^2+b^2}$,	$s > a$
$e^{at} \cos bt$		$\frac{(s-a)}{(s-a)^2+b^2}$,	$s > a$
$t \sin bt$		$\frac{2bs}{(s^2+b^2)^2}$	$s > 0$
$t \cos bt$		$\frac{s^2-b^2}{(s^2+b^2)^2}$ * ,	$s > 0$
$u_c(t) f(t),\ c \geq 0$		$e^{-cs} \mathcal{L}\{f(t+c)\}(s)$	
$u_c(t) f(t-c),\ c \geq 0$**		$e^{-cs} \mathcal{L}\{f(t)\}(s)$	
$y' = \dot{y} = \frac{dy}{dt}$		$sY(s) - y(0)$	
$y'' = \ddot{y} = \frac{d^2y}{dt^2}$		$s^2 Y(s) - sy(0) - \dot{y}(0)$	

*** NB.** $\frac{b^2}{(s^2+b^2)^2} = \frac{\frac{1}{2}}{s^2+b^2} - \frac{\frac{1}{2}(s^2-b^2)}{(s^2+b^2)^2}$

**** Definition:** $u_c(t) = \begin{cases} 0 & t < c \\ 1 & t \geq c \end{cases}$ which is also written as $u(t-c)$ or $H(t-c)$