$$\mathcal{L}[\frac{\mathrm{d}y}{\mathrm{d}t}] = s\mathcal{L}[y] - y(0)$$

$$\mathcal{L}[\frac{\mathrm{d}^2y}{\mathrm{d}t^2}] = s^2\mathcal{L}[y] - y'(0) - sy(0)$$

$$u_a(t) = \begin{cases} 1, & t \geq a \\ 0, & t < a \end{cases}$$

$$\delta_a(t) = \begin{cases} \infty, & t = a \\ 0, & t \neq a \end{cases} \qquad \int_{-\infty}^{\infty} \delta_a(t)\,\mathrm{d}t = 1$$

y	$\mathcal{L}[y]$
e^{at}	$\frac{1}{s-a}$
te^{at}	$\frac{1}{(s-a)^2}$
$\cos(\omega t)$	$\frac{s}{s^2+\omega^2}$
$\sin(\omega t)$	$\frac{\omega}{s^2+\omega^2}$
$t\cos(\omega t)$	$\frac{s^2-\omega^2}{(s^2+\omega^2)^2}$
$t\sin(\omega t)$	$\frac{2\omega s}{(s^2+\omega^2)^2}$

y	$\mathcal{L}[y]$
$u_a(t)$	$\frac{1}{s}e^{-as}$
$\delta_a(t)$	e^{-as}
$u_a(t)f(t-a)$	$e^{-as}F(s)$ where $F = \mathcal{L}[f]$