Fòrmulas bàsicas sobre transformada y su transformada inversa.

1) $\mathcal{L}\{t^n\} = \frac{n!}{s^{n+1}},\ \ n \in \mathbb{N}_0,\ \ s > 0.$	$\mathcal{L}^{-1}\left\{\frac{n!}{s^{n+1}}\right\} = t^n$
2) $\mathcal{L}\{e^{at}\} = \frac{1}{s-a},\ \ a \in \mathbb{R},\ s > a.$	$\mathcal{L}^{-1}\left\{\frac{1}{s-a}\right\} = e^{at}$
3) $\mathcal{L}\{\sin(kt)\} = \frac{k}{s^2+k^2}$	$\mathcal{L}^{-1}\left\{\frac{k}{s^2+k^2}\right\} = \sin(kt)$
4) $\mathcal{L}\{\cos(kt)\} = \frac{s}{s^2+k^2}$	$\mathcal{L}^{-1}\left\{\frac{s}{s^2+k^2}\right\} = \cos(kt)$
5) $\mathcal{L}\{e^{at}f(t)\} = F(s-a)$	$\mathcal{L}^{-1}\{F(s-a)\} = e^{at}f(t)$
6) $\mathcal{L}\{e^{at}\sin(kt)\} = \frac{k}{(s-a)^2+k^2}$	$\mathcal{L}^{-1}\left\{\frac{k}{(s-a)^2+k^2}\right\} = e^{at}\sin(kt)$
7) $\mathcal{L}\{e^{at}\cos(kt)\} = \frac{s-a}{(s-a)^2+k^2}$	$\mathcal{L}^{-1}\left\{\frac{s-a}{(s-a)^2+k^2}\right\} = e^{at}\cos(kt)$
8) $\mathcal{L}\{e^{at}t^n\} = \frac{n!}{(s-a)^{n+1}}$	$\mathcal{L}^{-1}\left\{\frac{n!}{(s-a)^{n+1}}\right\} = e^{at}t^n$
9) $\mathcal{L}\left\{f^{(n)}(t)\right\} = s^nF(s) - s^{n-1}f(0) - \cdots - sf^{(n-2)}(0) - f^{(n-1)}(0)$	$\mathcal{L}^{-1}\{F(s)\} = f(t)$
$\mathcal{L}\{f'(t)\} = sF(s) - f(0), \quad \mathcal{L}\{f''(t)\} = s^2F(s) - sf(0) - f'(0)$	
10) $\mathcal{L}\{f(t-a)\mu(t-a)\} = F(s)e^{-as}$	$\mathcal{L}^{-1}\{F(s)e^{-as}\} = f(t-a)\mu(t-a)$
11) $\mathcal{L}\{f(t)\mu(t-a)\} = e^{-as}\mathcal{L}\{f(t+a)\}$	$\mathcal{L}^{-1}\{e^{-as}\mathcal{L}\{f(t+a)\}\} = f(t)\mu(t-a)$
12) $\mathcal{L}\{t^nf(t)\} = (-1)^n\frac{d^nF(s)}{ds^n}$	$\mathcal{L}^{-1}\left\{(-1)^n\frac{d^nF(s)}{ds^n}\right\} = t^nf(t)$
13) $\mathcal{L}\{(f*g)(t)\} = \mathcal{L}\left\{\int_0^t f(z)g(t-z)dz\right\} = F(s)G(s)$	$\mathcal{L}^{-1}\{F(s)G(s)\} = \int_0^t f(z)g(t-z)dz$
14) $\mathcal{L}\left\{\int_0^t f(z)dz\right\} = \frac{F(s)}{s}$	$\mathcal{L}^{-1}\left\{\frac{F(s)}{s}\right\} = \int_0^t f(z)dz$
15) $\mathcal{L}\left\{\frac{f(t)}{t}\right\} = \int_s^\infty F(s)ds$	$\mathcal{L}^{-1}\left\{\int_s^\infty F(s)ds\right\} = \frac{f(t)}{t}$

Además, si

$$\boxed{f(t) = \begin{cases} g(t), & \text{si} \quad 0 \le t < a \\ h(t), & \text{si} \quad t \ge a \end{cases}}$$

entonces,

$$\boxed{f(t) = g(t) \ + [h(t) - g(t)]\,\mu(t-a)}$$

donde,

$$\boxed{\mu(t-a) = \begin{cases} 0, & \text{si} \quad 0 \le t < a \\ 1, & \text{si} \quad t \ge a \end{cases} \text{, función escalón unitario.}}$$