Table of Laplace transforms

Definition of the Laplace transform:

$$F(s) = L\{f(t)\}(s) = \int_0^\infty f(t)e^{-st}dt$$

$F(s) = L\{f(t)\}(s)$	$f(t) = L^{-1}\{F(s)\}(t)$	
$F(s)$	$f(t)$	T1
$C_1F_1(s) + C_2F_2(s)$	$C_1f_1(t) + C_2f_2(t)$	T2
$F(s+a)$	$e^{-at}f(t)$	T3
$e^{-as}F(s)$	$\begin{cases} 0 & ,t \le a \\ f(t-a) & ,t > a \end{cases}$	T4
$\frac{1}{a}F\left(\frac{s}{a}\right)$	$f(at)$	T5
$-\frac{d}{ds}F(s)$	$f(t)t$	T6
$\int_s^\infty F(\sigma)d\sigma$	$f(t)\frac{1}{t}$	T7
$F_1(s)F_2(s)$	$\int_0^t f_1(\tau)f_2(t-\tau)d\tau$	T8
$sF(s) - f(0)$	$f'(t)$	T9
$s^2F(s) - [sf(0) + f'(0)]$	$f''(t)$	T10
$s^nF(s) - \left[s^{n-1}f(0) + \cdots + f^{(n-1)}(0)\right]$	$f^{(n)}(t)$	T11
$\frac{1}{s}F(s) + \frac{1}{s}\left[\int_0^t f(\tau)d\tau\right]_{t\to+0}$	$\int_0^t f(\tau)d\tau$	T12

If limits for $f(t)$ and $F(s)$ exist, the following rules hold true:

$$\lim_{s\to 0}\{sF(s)\} = \lim_{t\to\infty}\{f(t)\} \qquad \lim_{s\to\infty}\{sF(s)\} = \lim_{t\to 0}\{f(t)\}$$

$F(s) = L\{f(t)\}(s)$	$f(t) = L^{-1}\{F(s)\}(t)$	
1	$\delta(t)$	M1
$\frac{1}{s}$	1	M2
$\frac{1}{s^2}$	t	M3
$\frac{1}{s^{n+1}}$	$\frac{t^n}{n!}$	M4
$\frac{1}{s+a}$	e^{-at}	M5
$\frac{1}{(s+a)^2}$	te^{-at}	M6
$\frac{1}{(s+a)^{n+1}}$	$\frac{t^n e^{-at}}{n!}$	M7
$\frac{1}{s(s+a)}$	$\frac{1}{a}(1-e^{-at})$	M8
$\frac{1}{(s+a)(s+b)}$	$\frac{1}{a-b}(e^{-bt}-e^{-at})$	M9
$\frac{1}{s(s+a)(s+b)}$	$\frac{1}{ab}+\frac{1}{ab(b-a)}(ae^{-bt}-be^{-at})$	M10
$\frac{a}{s^2+a^2}$	$\sin(at)$	M11
$\frac{s}{s^2+a^2}$	$\cos(at)$	M12
$\frac{a}{(s+b)^2+a^2}$	$e^{-bt}\sin(at)$	M13
$\frac{s+b}{(s+b)^2+a^2}$	$e^{-bt}\cos(at)$	M14
$\frac{s+a}{s+b}$	$\delta(t)+(a-b)e^{-bt}$	M15