Elementary Laplace Transforms

(1)	$\mathcal{L}(1)(s)$	$=$	$\frac{1}{s}$ $(s > 0)$
(2)	$\mathcal{L}(e^{at})(s)$	$=$	$\frac{1}{s-a}$ $(s > a)$
(3)	$\mathcal{L}(t^n)(s)$	$=$	$\frac{n!}{s^{n+1}}$ $(s > 0,\ n$ a positive integer$)$
(4)	$\mathcal{L}(t^p)(s)$	$=$	$\frac{\Gamma(p+1)}{s^{p+1}}$ $(s > 0,\ p > -1)$
(5)	$\mathcal{L}(\sin(at))(s)$	$=$	$\frac{a}{s^2+a^2}$ $(s > 0)$
(6)	$\mathcal{L}(\cos(at))(s)$	$=$	$\frac{s}{s^2+a^2}$ $(s > 0)$
(7)	$\mathcal{L}(e^{at} \cdot \sin(bt))(s)$	$=$	$\frac{b}{(s-a)^2+b^2}$ $(s > a)$
(8)	$\mathcal{L}(e^{at} \cdot \cos(bt))(s)$	$=$	$\frac{s-a}{(s-a)^2+b^2}$ $(s > a)$
(9)	$\mathcal{L}(\sinh(at))(s)$	$=$	$\frac{a}{s^2-a^2}$ $(s > \lvert a\rvert)$
(10)	$\mathcal{L}(\cosh(at))(s)$	$=$	$\frac{s}{s^2-a^2}$ $(s > \lvert a\rvert)$
(11)	$\mathcal{L}(t^n \cdot e^{at})(s)$	$=$	$\frac{n!}{(s-a)^{n+1}}$ $(s > a,\ n$ a positive integer$)$
(12)	$\mathcal{L}(t^n \cdot f(t))(s)$	$=$	$(-1)^n \frac{d^n}{ds^n}\left(\mathcal{L}(f(t))\right)(s)$ $(n$ a positive integer$)$
(13)	$\mathcal{L}((-t)^n \cdot f(t))(s)$	$=$	$\mathcal{L}(f(t))^{(n)}(s)$ $(n$ a positive integer$)$
(14)	$\mathcal{L}(f'(t))(s)$	$=$	$s\mathcal{L}(f(t))(s) - f(0)$
(15)	$\mathcal{L}(f^{(n)}(t))(s)$	$=$	$s^n\mathcal{L}(f(t))(s) - s^{n-1}f(0) - \cdots - f^{(n-1)}(0)$
(16)	$\mathcal{L}(H_c(t))(s)$	$=$	$\frac{e^{-cs}}{s}$ $(s > 0)$
(17)	$\mathcal{L}(H_c(t) \cdot f(t-c))(s)$	$=$	$e^{-cs}\mathcal{L}(f(t))(s)$
(18)	$\mathcal{L}(H_c(t) \cdot f(t))(s)$	$=$	$e^{-cs}\mathcal{L}(f(t+c))(s)$
(19)	$\mathcal{L}(\delta(t-c))(s) = \mathcal{L}(\delta_c(t))(s)$	$=$	e^{-cs}
(20)	$\mathcal{L}(e^{ct} \cdot f(t))(s)$	$=$	$\mathcal{L}(f(t))(s-c)$