Table of Laplace Transforms

$f(t) = \mathcal{L}^{-1}\{F(s)\}$	$F(s) = \mathcal{L}\{f(t)\}$		$f(t) = \mathcal{L}^{-1}\{F(s)\}$	$F(s) = \mathcal{L}\{f(t)\}$
1.	1	$\dfrac{1}{s}$	2. e^{at}	$\dfrac{1}{s-a}$
3.	t^n	$\dfrac{n!}{s^{n+1}}$	4. $t^p,\, p > -1$	$\dfrac{\Gamma(p+1)}{s^{p+1}}$
5.	$\sqrt{t}$	$\dfrac{\sqrt{\pi}}{2\sqrt{s}}$	6. $t^{n-\frac{1}{2}},\, n = 1,2,3,\ldots$	$\dfrac{1 \cdot 3 \cdot 5 \cdots (2n-1)\sqrt{\pi}}{2^n s^{n+\frac{1}{2}}}$
7.	$\sin(at)$	$\dfrac{a}{s^2 + a^2}$	8. $\cos(at)$	$\dfrac{s}{s^2 + a^2}$
9.	$t\sin(at)$	$\dfrac{2as}{\left(s^2 + a^2\right)^2}$	10. $t\cos(at)$	$\dfrac{s^2 - a^2}{\left(s^2 + a^2\right)^2}$
11.	$\sin(at) - at\cos(at)$	$\dfrac{2a^3}{\left(s^2 + a^2\right)^2}$	12. $\sin(at) + at\cos(at)$	$\dfrac{2as^2}{\left(s^2 + a^2\right)^2}$
13.	$\cos(at) - at\sin(at)$	$\dfrac{s\left(s^2 - a^2\right)}{\left(s^2 + a^2\right)^2}$	14. $\cos(at) + at\sin(at)$	$\dfrac{s\left(s^2 + 3a^2\right)}{\left(s^2 + a^2\right)^2}$
15.	$\sin(at + b)$	$\dfrac{s\sin(b) + a\cos(b)}{s^2 + a^2}$	16. $cos(at + b)$	$\dfrac{s\cos(b) - a\sin(b)}{s^2 + a^2}$
17.	$\sinh(at)$	$\dfrac{a}{s^2 - a^2}$	18. $\cosh(at)$	$\dfrac{s}{s^2 - a^2}$
19.	$e^{at}\sin(bt)$	$\dfrac{b}{\left(s - a\right)^2 + b^2}$	20. $e^{at}\cos(bt)$	$\dfrac{s - a}{\left(s - a\right)^2 + b^2}$
21.	$e^{at}\sinh(bt)$	$\dfrac{b}{\left(s - a\right)^2 - b^2}$	22. $e^{at}\cosh(bt)$	$\dfrac{s - a}{\left(s - a\right)^2 - b^2}$
23.	$t^n e^{at},\, n = 1,2,3,\ldots$	$\dfrac{n!}{\left(s - a\right)^{n+1}}$	24. $f(ct)$	$\dfrac{1}{c}F\left(\dfrac{s}{c}\right)$
25.	$u_c(t) = u(t - c)$ Heaviside Function	$\dfrac{e^{-cs}}{s}$	26. $\delta(t - c)$ Dirac Delta Function	e^{-cs}
27.	$u_c(t)f(t - c)$	$e^{-cs}F(s)$	28. $u_c(t)g(t)$	$e^{-cs}\mathcal{L}\{g(t + c)\}$
29.	$e^{ct}f(t)$	$F(s - c)$	30. $t^n f(t),\, n = 1,2,3,\ldots$	$(-1)^n F^{(n)}(s)$
31.	$\frac{1}{t}f(t)$	$\int_s^\infty F(u)\,du$	32. $\int_0^t f(v)\,dv$	$\dfrac{F(s)}{s}$
33.	$\int_0^1 f(t - \tau)g(\tau)\,d\tau$	$F(s)G(s)$	34. $f(t + T) = f(t)$	$\dfrac{\displaystyle\int_0^T e^{-st}f(t)\,dt}{1 - e^{-sT}}$
35.	$f'(t)$	$sF(s) - f(0)$	36. $f''(t)$	$s^2 F(s) - sf(0) - f'(0)$
37.	$f^{(n)}(t)$	$s^n F(s) - s^{n-1}f(0) - s^{n-2}f'(0)\cdots - sf^{(n-2)}(0) - f^{(n-1)}(0)$		