Table of LaPlace Transforms

$f(t)$	$\mathscr{L}\{f(t)\} = F(s)$		$f(t)$	$\mathscr{L}\{f(t)\} = F(s)$		$f(t)$	$\mathscr{L}\{f(t)\} = F(s)$
1. 1	$\dfrac{1}{s}$		14. $\sinh^2 kt$	$\dfrac{2k^2}{s(s^2 - 4k^2)}$		27. $t\cosh kt$	$\dfrac{s^2 + k^2}{(s^2 + k^2)^2}$
2. t	$\dfrac{1}{s^2}$		15. $\cosh^2 kt$	$\dfrac{s^2 - 2k^2}{s(s^2 - 4k^2)}$		28. $\dfrac{e^{at} - e^{bt}}{a - b}$	$\dfrac{1}{(s-a)(s-b)}$
3. t^n	$\dfrac{n!}{s^{n+1}}$, n is a positive integer		16. te^{at}	$\dfrac{1}{(s-a)^2}$		29. $\dfrac{ae^{at} - be^{bt}}{a - b}$	$\dfrac{s}{(s-a)(s-b)}$
4. $t^{-1/2}$	$\sqrt{\dfrac{\pi}{s}}$		17. $t^n e^{at}$	$\dfrac{n!}{(s-a)^{n+1}}$, n is a positive integer		30. $1 - \cos kt$	$\dfrac{k^2}{s(s^2 + k^2)}$
5. $t^{1/2}$	$\dfrac{\sqrt{\pi}}{2s^{3/2}}$		18. $e^{at}\sin kt$	$\dfrac{k}{(s-a)^2 + k^2}$		31. $kt - \sin kt$	$\dfrac{k^3}{s^2(s^2 + k^2)}$
6. t^α	$\dfrac{\Gamma(\alpha + 1)}{s^{\alpha+1}}$, $\alpha > -1$		19. $e^{at}\cos kt$	$\dfrac{s - a}{(s-a)^2 + k^2}$		32. $\dfrac{a\sin bt - b\sin at}{ab(a^2 - b^2)}$	$\dfrac{1}{(s^2 + a^2)(s^2 + b^2)}$
7. $\sin kt$	$\dfrac{k}{s^2 + k^2}$		20. $e^{at}\sinh kt$	$\dfrac{k}{(s-a)^2 - k^2}$		33. $\dfrac{\cos bt - \cos at}{a^2 - b^2}$	$\dfrac{s}{(s^2 + a^2)(s^2 + b^2)}$
8. $\cos kt$	$\dfrac{s}{s^2 + k^2}$		21. $e^{at}\cosh kt$	$\dfrac{s - a}{(s-a)^2 - k^2}$		34. $\sin kt \sinh kt$	$\dfrac{2k^2 s}{s^4 + 4k^4}$
9. $\sin^2 kt$	$\dfrac{2k^2}{s(s^2 + 4k^2)}$		22. $t\sin kt$	$\dfrac{2ks}{(s^2 + k^2)^2}$		35. $\sin kt \cosh kt$	$\dfrac{k(s^2 + 2k^2)}{s^4 + 4k^4}$
10. $\cos^2 kt$	$\dfrac{s^2 + 2k^2}{s(s^2 + 4k^2)}$		23. $t\cos kt$	$\dfrac{s^2 - k^2}{(s^2 + k^2)^2}$		36. $\cos kt \sinh kt$	$\dfrac{k(s^2 - 2k^2)}{s^4 + 4k^4}$
11. e^{at}	$\dfrac{1}{s - a}$		24. $\sin kt + kt\cos kt$	$\dfrac{2ks^2}{(s^2 + k^2)^2}$		37. $\cos kt \cosh kt$	$\dfrac{s^3}{s^4 + 4k^4}$
12. $\sinh kt$	$\dfrac{k}{s^2 - k^2}$		25. $\sin kt - kt\cos kt$	$\dfrac{2ks^3}{(s^2 + k^2)^2}$		38. $J_0(kt)$	$\dfrac{1}{\sqrt{s^2 + k^2}}$
13. $\cosh kt$	$\dfrac{s}{s^2 - k^2}$		26. $t\sinh kt$	$\dfrac{2ks}{(s^2 - k^2)^2}$		39. $\dfrac{e^{bt} - e^{at}}{t}$	$\ln\left(\dfrac{s-a}{s-b}\right)$

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$f(t)$	$\mathcal{L}\{f(t)\} = F(s)$	$f(t)$	$\mathcal{L}\{f(t)\} = F(s)$
40. $\dfrac{2(1-\cos kt)}{t}$	$\ln\left(\dfrac{s^2+k^2}{s^2}\right)$	50. $\delta(t)$	1
41. $\dfrac{2(1-\cosh kt)}{t}$	$\ln\left(\dfrac{s^2-k^2}{s^2}\right)$	51. $\delta(t-t_0)$	$e^{(-st_0)}$
42. $\dfrac{\sin at}{t}$	$\arctan\left(\dfrac{a}{s}\right)$	52. $e^{at}f(t)$	$F(s-a)$
43. $\dfrac{\sin at\cos bt}{t}$	$\dfrac{1}{2}\arctan\left(\dfrac{a+b}{s}\right) + \dfrac{1}{2}\arctan\left(\dfrac{a-b}{s}\right)$	53. $f(t-a)\,\mathcal{U}(t-a)$	$e^{-as}F(s)$
44. $\dfrac{1}{\sqrt{\pi t}}e^{(-a^2/4t)}$	$\dfrac{e^{\left(-a/\sqrt{s}\right)}}{\sqrt{s}}$	54. $\mathcal{U}(t-a)$	$\dfrac{e^{-as}}{s}$
45. $\dfrac{a}{2\sqrt{\pi t}}e^{(-a^2/4t)}$	$e^{\left(-a\sqrt{s}\right)}$	55. $f^{(n)}(t)$	$s^n F(s) - s^{(n-1)}f(0) - \ldots - f^{(n-1)}(0)$
46. $\mathrm{erfc}\left(\dfrac{a}{2\sqrt{t}}\right)$	$\dfrac{e^{\left(-a\sqrt{s}\right)}}{s}$	56. $t^n f(t)$	$(-1)^n\dfrac{d^n}{ds^n}F(s)$
47. $2\sqrt{\dfrac{t}{\pi}}e^{(-a^2/4t)} - a\cdot\mathrm{erfc}\left(\dfrac{a}{2\sqrt{t}}\right)$	$\dfrac{e^{\left(-a\sqrt{s}\right)}}{s\sqrt{s}}$	57. $\displaystyle\int_0^t f(\tau)g(t-\tau)d\tau$	$F(s)G(s)$
48. $e^{ab}e^{b^2 t}\cdot\mathrm{erfc}\left(b\sqrt{t} + \dfrac{a}{2\sqrt{t}}\right)$	$\dfrac{e^{\left(-a\sqrt{s}\right)}}{\sqrt{s}\left(\sqrt{s}+b\right)}$		
49. $-e^{ab}e^{b^2 t}\cdot\mathrm{erfc}\left(b\sqrt{t} + \dfrac{a}{2\sqrt{t}}\right) + \mathrm{erfc}\left(\dfrac{a}{2\sqrt{t}}\right)$	$\dfrac{be^{\left(-a\sqrt{s}\right)}}{\sqrt{s}\left(\sqrt{s}+b\right)}$		