

LAPLACE TRANSFORMS AND INVERSE LAPLACE TRANSFORMS

S.NO	LAPLACE TRANSFORM	INVERSE LAPLACE TRANSFORM
1	$L\{f(t)\} = \int_0^{\infty} e^{-st} f(t) dt = \bar{f}(s)$	$L^{-1}\bar{f}(s) = f(t)$
2	$L\{1\} = \frac{1}{s}$	$L^{-1}\left\{\frac{1}{s}\right\} = 1$
3	$L\{k\} = \frac{k}{s}$	$L^{-1}\left\{\frac{k}{s}\right\} = k$
4	$L\{e^{at}\} = \frac{1}{s-a}$	$L^{-1}\left\{\frac{1}{s-a}\right\} = e^{at}$
4	$L\{e^{-at}\} = \frac{1}{s+a}$	$L^{-1}\left\{\frac{1}{s+a}\right\} = e^{-at}$
5	$L\{\sin at\} = \frac{a}{s^2 + a^2}$	$L^{-1}\left\{\frac{1}{s^2 + a^2}\right\} = \frac{\sin at}{a}$
6	$L\{\cos at\} = \frac{s}{s^2 + a^2}$	$L^{-1}\left\{\frac{s}{s^2 + a^2}\right\} = \cos at$
7	$L\{\sinh at\} = \frac{a}{s^2 - a^2}$	$L^{-1}\left\{\frac{1}{s^2 - a^2}\right\} = \frac{\sinh at}{a}$
8	$L\{\cosh at\} = \frac{s}{s^2 - a^2}$	$L^{-1}\left\{\frac{s}{s^2 - a^2}\right\} = \cosh at$
9	$L\{t\} = \frac{1}{s^2}$	$L^{-1}\left\{\frac{1}{s^2}\right\} = t$
10	$L\{t^2\} = \frac{2!}{s^3}$	$L^{-1}\left\{\frac{1}{s^3}\right\} = \frac{t^2}{2!}$
11	$L\{t^3\} = \frac{3!}{s^4}$	$L^{-1}\left\{\frac{1}{s^4}\right\} = \frac{t^3}{3!}$
12	$L\{t^n\} = \frac{n!}{s^{n+1}}$	$L^{-1}\left\{\frac{1}{s^{n+1}}\right\} = \frac{t^n}{n!}$
13	$\int n = \int_0^{\infty} e^{-x} x^{n-1} dx$ AND $\int n + 1 = n!$ AND $\int n + 1 = n \int n$	
14	$\int \frac{1}{2} = \sqrt{\pi}$ AND $\int \frac{3}{2} = \frac{\sqrt{\pi}}{2}$	
15	$\int \frac{5}{2} = \frac{3\sqrt{\pi}}{4}$	
16	$\int \frac{-1}{2} = -2\sqrt{\pi}$ AND $\int \frac{-3}{2} = \frac{4\sqrt{\pi}}{3}$	
17	$\int \frac{-5}{2} = -\frac{18}{5}\sqrt{\pi}$	
18	$2\sin A \cos B = \sin(A + B) + \sin(A - B)$	
19	$2\cos A \sin B = \sin(A + B) - \sin(A - B)$	
20	$2\cos A \cos B = \cos(A + B) + \cos(A - B)$	
21	$2\sin A \sin B = \cos(A - B) - \cos(A + B)$	
22	$\sin 2A = 2\sin A \cos A$	
23	$\sin^2 A = \frac{1 - \cos 2A}{2}$ AND $\cos^2 A = \frac{1 + \cos 2A}{2}$	
24	$\sinh^3 x = \frac{(\sinh 3x - 3\sinh x)}{4}$	
25	$\cosh^3 x = \frac{(\cosh 3x + 3\cosh x)}{4}$	

26	$\cos^3 x = \frac{(\cos 3x + 3\cos x)}{4}$
27	$\sin^3 x = \frac{(3\sin x - \sin 3x)}{4}$