

Tabel van Laplace getransformeerden

No.	$f(t) = \mathcal{L}^{-1}[F(s)]$	$F(s) = \mathcal{L}[f(t)] = \int_0^{\infty} e^{-st} f(t) dt$
(l.1)	1	$\frac{1}{s}, s > 0$
(l.2)	e^{at}	$\frac{1}{s-a}, s > a$
(l.3)	$\sin at$	$\frac{a}{s^2 + a^2}, s > 0$
(l.4)	$t^n, n \in \mathbb{N}$	$\frac{n!}{s^{n+1}}, s > 0$
(l.5)	$t^p, p > -1$	$\frac{\Gamma(p+1)}{s^{p+1}}, s > 0$
(l.6)	$\cos at$	$\frac{s}{s^2 + a^2}, s > 0$
(l.7)	$\sinh at$	$\frac{a}{s^2 - a^2}, s > a $
(l.8)	$\cosh at$	$\frac{s}{s^2 - a^2}, s > a $
(l.9)	$e^{at} \sin bt$	$\frac{b}{(s-a)^2 + b^2}, s > a$
(l.10)	$e^{at} \cos bt$	$\frac{s-a}{(s-a)^2 + b^2}, s > a$
(l.11)	$t^n e^{at}, n \in \mathbb{N}$	$\frac{n!}{(s-a)^{n+1}}, s > a$
(l.12)	$u_a(t)$	$\frac{e^{-as}}{s}, s > 0$
(l.13)	$u_a(t)f(t-a)$	$e^{-as} F(s)$
(l.14)	$e^{at} f(t)$	$F(s-a)$
(l.15)	$f(at)$	$\frac{1}{a} F\left(\frac{s}{a}\right), a > 0$
(l.16)	$\int_0^t f(t-\tau)g(\tau) d\tau$	$F(s)G(s)$
(l.17)	$\delta(t-a)$	e^{-as}
(l.18)	$f^{(n)}(t)$	$s^n F(s) - s^{n-1}f(0) - \dots - f^{(n-1)}(0)$
(l.19)	$(-t)^n f(t)$	$F^{(n)}(s)$

Formuleblad

behorend bij Analyse

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Enkele goniometrische formules

No.

- (g.1) $\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta.$
 (g.2) $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta.$
 (g.3) $\sin \alpha + \sin \beta = 2 \sin \frac{1}{2}(\alpha + \beta) \cos \frac{1}{2}(\alpha - \beta).$
 (g.4) $\cos \alpha + \cos \beta = 2 \cos \frac{1}{2}(\alpha + \beta) \cos \frac{1}{2}(\alpha - \beta).$
 (g.5) $\cos \alpha - \cos \beta = -2 \sin \frac{1}{2}(\alpha + \beta) \sin \frac{1}{2}(\alpha - \beta).$
 (g.6) $\sin^2 \alpha = \frac{1}{2}(1 - \cos 2\alpha).$
 (g.7) $\cos^2 \alpha = \frac{1}{2}(1 + \cos 2\alpha).$
 (g.8) $1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha}.$
 (g.9) $\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}.$

Standaard Taylorontwikkelingen

No.

- (s.1) $e^x = 1 + x + \frac{x^2}{2!} + \dots + \frac{x^n}{n!} + O(x^{n+1}).$
 (s.2) $\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots + (-1)^n \frac{x^{2n+1}}{(2n+1)!} + O(x^{2n+3}).$
 (s.3) $\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \dots + (-1)^n \frac{x^{2n}}{(2n)!} + O(x^{2n+2}).$
 (s.4) $\frac{1}{1-x} = 1 + x + x^2 + \dots + x^n + O(x^{n+1}).$
 (s.5) $\ln(1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \dots + (-1)^n \frac{x^{n+1}}{n+1} + O(x^{n+2}).$
 (s.6) $\arctan x = x - \frac{x^3}{3} + \frac{x^5}{5} - \dots + (-1)^n \frac{x^{2n+1}}{2n+1} + O(x^{2n+3}).$
 (s.7) $(1+x)^a = 1 + ax + \frac{a(a-1)}{2!} x^2 + \dots + \binom{a}{n} x^n + O(x^{n+1}), a \in \mathbb{R}.$
 Hierbij is $\binom{a}{n} = \frac{a(a-1)\dots(a-n+1)}{n!}$ als $n > 0$ en $\binom{a}{0} = 1.$

Integraaltabel

(t.1)	$\int x^a dx$	$= \frac{1}{a+1} x^{a+1} \quad (a \in \mathbb{R} \setminus \{-1\}).$	(t.18)	$\int e^{ax} \cos bx dx$	$= \frac{e^{ax}}{a^2 + b^2} (a \cos bx + b \sin bx) \quad (a^2 + b^2 \neq 0).$
(t.2)	$\int \frac{dx}{x}$	$= \ln x .$	(t.19)	$\int \frac{dx}{a^2 + b^2 x^2}$	$= \frac{1}{ab} \arctan \frac{bx}{a} \quad (a, b \in \mathbb{R}^+).$
(t.3)	$\int \frac{f'(x)}{f(x)} dx$	$= \ln f(x) .$	(t.20)	$\int \frac{dx}{a^2 - b^2 x^2}$	$= \frac{1}{2ab} \ln \left \frac{a+bx}{a-bx} \right \quad (a, b \in \mathbb{R}^+).$
(t.4)	$\int e^x dx$	$= e^x.$	(t.21)	$\int \frac{dx}{\sqrt{a^2 - x^2}}$	$= \arcsin \frac{x}{a} \quad (a \in \mathbb{R}^+).$
(t.5)	$\int a^x dx$	$= \frac{1}{\ln a} a^x \quad (a \in \mathbb{R}^+ \setminus \{1\}).$	(t.22)	$\int \frac{dx}{\sqrt{a^2 + x^2}}$	$= \ln (x + \sqrt{x^2 + a^2}) \quad (a \in \mathbb{R}^+).$
(t.6)	$\int \sin x dx$	$= -\cos x.$	(t.23)	$\int \frac{dx}{\sqrt{x^2 - a^2}}$	$= \ln x + \sqrt{x^2 - a^2} \quad (a \in \mathbb{R}^+).$
(t.7)	$\int \cos x dx$	$= \sin x.$	(t.24)	$\int \sqrt{a^2 - x^2} dx$	$= \frac{x}{2} \sqrt{a^2 - x^2} + \frac{a^2}{2} \arcsin \frac{x}{a} \quad (a \in \mathbb{R}^+).$
(t.8)	$\int \frac{dx}{\sin^2 x}$	$= -\cot x.$	(t.25)	$\int \sqrt{a^2 + x^2} dx$	$= \frac{x}{2} \sqrt{a^2 + x^2} + \frac{a^2}{2} \ln (x + \sqrt{a^2 + x^2}) \quad (a \in \mathbb{R}^+).$
(t.9)	$\int \frac{dx}{\cos^2 x}$	$= \tan x.$	(t.26)	$\int \sinh x dx$	$= \cosh x.$
(t.10)	$\int \tan x dx$	$= -\ln \cos x .$	(t.27)	$\int \cosh x dx$	$= \sinh x.$
(t.11)	$\int \frac{dx}{\sin x}$	$= \ln \left \tan \frac{x}{2} \right = \ln \frac{1 - \cos x}{ \sin x } = \ln \frac{ \sin x }{1 + \cos x}.$	(t.28)	$\int_0^a \sqrt{a^2 - x^2} dx$	$= \frac{\pi a^2}{4} \quad (a \in \mathbb{R}^+).$
(t.12)	$\int \frac{dx}{\cos x}$	$= \ln \left \tan \left(\frac{x}{2} + \frac{\pi}{4} \right) \right = \ln \frac{1 + \sin x}{ \cos x } = \ln \frac{ \cos x }{1 - \sin x}.$	(t.29)	$\int_0^{\frac{\pi}{2}} \sin^p x dx = \int_0^{\frac{\pi}{2}} \cos^p x dx$	$= \frac{p-1}{p} \frac{p-3}{p-2} \dots \frac{4}{5} \frac{2}{3}$ voor $p = \text{oneven} \geq 3,$ $= \frac{p-1}{p} \frac{p-3}{p-2} \dots \frac{3}{4} \frac{1}{2}$ voor $p = \text{even} \geq 2.$
(t.13)	$\int \sin^p x \cos^q x dx \quad (p, q \in \mathbb{N})$	p oneven, stel $\cos x = t.$ q oneven, stel $\sin x = t.$ p en q even, voer dubbele hoek in met behulp van $\cos^2 x = \frac{1 + \cos 2x}{2}$ of $\sin^2 x = \frac{1 - \cos 2x}{2}.$	(t.30)	$\int_0^{\infty} e^{-x} x^n dx$	$= n! \quad (n \in \mathbb{N}).$
(t.14)	$\int \sin mx \sin nx dx$	$= \frac{\sin(m-n)x}{2(m-n)} - \frac{\sin(m+n)x}{2(m+n)} \quad (m^2 \neq n^2).$	(t.31)	$\int_0^1 x^n (1-x)^m dx$	$= \frac{(n!)(m!)}{(m+n+1)!} \quad (n, m \in \mathbb{N}).$
(t.15)	$\int \cos mx \cos nx dx$	$= \frac{\sin(m-n)x}{2(m-n)} + \frac{\sin(m+n)x}{2(m+n)} \quad (m^2 \neq n^2).$			
(t.16)	$\int \sin mx \cos nx dx$	$= -\frac{\cos(m-n)x}{2(m-n)} - \frac{\cos(m+n)x}{2(m+n)} \quad (m^2 \neq n^2).$			
(t.17)	$\int e^{ax} \sin bx dx$	$= \frac{e^{ax}}{a^2 + b^2} (a \sin bx - b \cos bx) \quad (a^2 + b^2 \neq 0).$			