Goniometrie

α	$\sin\alpha$	$\cos\alpha$	$\tan\alpha$	$\operatorname{cotg}\alpha$
0°	0	1	0	∞
30°	½	$\frac{1}{2}\sqrt{3} = 0{,}866$	$\frac{1}{3}\sqrt{3} = 0{,}577$	$\sqrt{3} = 1{,}732$
45°	$\frac{1}{2}\sqrt{2} = 0{,}707$	$\frac{1}{2}\sqrt{2} = 0{,}707$	1	1
60°	$\frac{1}{2}\sqrt{3} = 0{,}866$	½	$\sqrt{3} = 1{,}732$	$\frac{1}{3}\sqrt{3} = 0{,}577$
90°	1	0	∞	0

$$\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \cos\alpha\sin\beta$$
$$\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta$$

$$\tan(\alpha \pm \beta) = \frac{\tan\alpha \pm \tan\beta}{1 \mp \tan\alpha\tan\beta}$$

$$\operatorname{cotg}(\alpha \pm \beta) = \frac{\operatorname{cotg}\alpha\operatorname{cotg}\beta \mp 1}{\operatorname{cotg}\beta \pm \operatorname{cotg}\alpha}$$

$$\sin\alpha + \sin\beta = 2\sin\frac{(\alpha+\beta)}{2}\cos\frac{(\alpha-\beta)}{2}$$

$$\sin\alpha - \sin\beta = 2\cos\frac{(\alpha+\beta)}{2}\sin\frac{(\alpha-\beta)}{2}$$

$$\cos\alpha + \cos\beta = 2\cos\frac{(\alpha+\beta)}{2}\cos\frac{(\alpha-\beta)}{2}$$

$$\cos\alpha - \cos\beta = -2\sin\frac{(\alpha+\beta)}{2}\sin\frac{(\alpha-\beta)}{2}$$

$$\sin\alpha\sin\beta = \tfrac{1}{2}\cos(\alpha-\beta) - \tfrac{1}{2}\cos(\alpha+\beta)$$
$$\cos\alpha\cos\beta = \tfrac{1}{2}\cos(\alpha-\beta) + \tfrac{1}{2}\cos(\alpha+\beta)$$
$$\sin\alpha\cos\beta = \tfrac{1}{2}\sin(\alpha+\beta) + \tfrac{1}{2}\sin(\alpha-\beta)$$

$$\tan\alpha \pm \tan\beta = \frac{\sin(\alpha\pm\beta)}{\cos\alpha\cos\beta}$$

$$\operatorname{cotg}\alpha \pm \operatorname{cotg}\beta = \frac{\sin(\beta\pm\alpha)}{\sin\alpha\sin\beta}$$

Merkwaardige produkten

$(a+b)(a-b) = a^2 - b^2$

$(a \pm b)^2 = a^2 \pm 2ab + b^2$

$(a \pm b)^3 = a^3 \pm 3a^2b \mp 3ab^2 \pm b^3$

$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$

$(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2ac + 2bc$

$\sin^2\alpha + \cos^2\alpha = 1$

$1 + \tan^2\alpha = \sec^2\alpha$

$1 + \operatorname{cotg}^2\alpha = \operatorname{cosec}^2\alpha$

Reeks ontwikkelingen

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} \dots = \sum_{k=0}^{\infty} \frac{x^k}{k!}$$

$$\ln(1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} + \frac{x^4}{4} + \frac{x^5}{5} \dots = \sum_{k=1}^{\infty} (-1)^{k+1} \frac{x^k}{k}, (-1 < x \leq 1)$$

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} \dots = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k+1}}{(2k+1)!}$$

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} \dots = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k}}{(2k)!}$$

$$\arcsin x = x + \frac{1}{2} \cdot \frac{x^3}{3} + \frac{1 \cdot 3}{2 \cdot 4} \cdot \frac{x^5}{5} \cdot \frac{1 \cdot 3 \cdot 5}{2 \cdot 4 \cdot 6} \cdot \frac{x^7}{7} + \frac{1 \cdot 3 \cdot 5 \cdot 7}{2 \cdot 4 \cdot 6 \cdot 8} \frac{x^9}{9} \dots, (|x| \leq 1)$$

$$\arctan x = x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \frac{x^9}{9} \dots = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k+1}}{2k+1}, (|x| \leq 1)$$

$$\sinh x = x + \frac{x^3}{3!} + \frac{x^5}{5!} + \frac{x^7}{7!} + \frac{x^9}{9!} \dots = \sum_{k=0}^{\infty} \frac{x^{2k+1}}{(2k+1)!}$$

$$\cosh x = 1 + \frac{x^2}{2!} + \frac{x^4}{4!} + \frac{x^6}{6!} + \frac{x^8}{8!} \dots = \sum_{k=0}^{\infty} \frac{x^{2k}}{(2k)!}$$

Standaardafgeleiden

$y = x^n$	$y' = n \cdot x^{n-1}$
$y = \sin x$	$y^1 = \cos x$
$y = \cos x$	$y' = -\sin x$
$y = \tan x$	$y' = \dfrac{1}{\cos^2 x}$
$y = \text{cotg}\, x$	$y' = \dfrac{-1}{\sin^2 x}$
$y = \arcsin x$	$y' = \dfrac{1}{\sqrt{(1 - x^2)}}$, $\lvert x \rvert < 1$
$y = \arccos x$	$y' = \dfrac{-1}{\sqrt{(1 - x^2)}}$, $\lvert x \rvert < 1$
$y = \arctan x$	$y' = \dfrac{1}{1 + x^2}$
$y = \text{arccotg}\, x$	$y' = \dfrac{-1}{(1 + x^2)}$
$y = {}^e\log x = \ln x$	$y' = \dfrac{1}{x}$, $x > 0$
$y = e^x$	$y' = y = e^x$
$y = a^x$	$y' = a^x \ln a$
$y = \sinh x$	$y' = \cosh x$
$y = \cosh x$	$y' = \sinh x$
$y = \tanh x$	$y' = \dfrac{1}{\cosh^2 x}$
$y = \text{cotgh}\, x$	$y' = \dfrac{1}{\sinh^2 x}$
$y = \text{arsinh}\, x = \ln (x + \sqrt{x^2 + 1})$	$y' = \dfrac{1}{\sqrt{x^2 + 1}}$
$y = \text{arcosh}\, x = \ln (x + \sqrt{x^2 - 1})$	$y' = \dfrac{1}{\sqrt{x^2 - 1}}$, $x > 1$
$y = \text{artanh}\, x = \tfrac{1}{2} \ln \dfrac{1 + x}{1 - x}$	$y' = \dfrac{1}{(1 - x^2)}$, $-1 < x < 1$
$y = \text{arcotgh}\, x = \tfrac{1}{2} \ln \dfrac{x + 1}{x - 1}$	$y' = \dfrac{1}{(1 - x^2)}$, $\lvert x \rvert > 1$.

Standaardintegralen

$$\int x^n \, dx = \frac{1}{n+1} x^{n+1}, \; n \neq -1$$

$$\int e^x \, dx = e^x \qquad \int \frac{1}{\sqrt{1-x^2}} \, dx = \arcsin x$$

$$\int \frac{1}{x} \, dx = \ln x \quad x > 0 \qquad \int \cosh x \, dx = \sinh x$$

$$\int \sin x \, dx = -\cos x \qquad \int \sinh x \, dx = \cosh x$$

$$\int \cos x \, dx = \sin x \qquad \int \frac{1}{\cosh^2 x} \, dx = \operatorname{artanh} x$$

$$\int \frac{1}{\cos^2 x} \, dx = \tan x \qquad \int \frac{1}{\sqrt{1+x^2}} \, dx = \operatorname{arsinh} x = \ln\left(x + \sqrt{x^2+1}\right)$$

$$\int \frac{1}{\sin^2 x} \, dx = \operatorname{cotg} x \qquad \int \frac{1}{\sqrt{x^2-1}} \, dx = \operatorname{arcosh} x = \ln\left(x + \sqrt{x^2-1}\right) \quad x^2 > 1$$

$$\int \frac{1}{1+x^2} \, dx = \arctan x$$

Laplace-transformaties

f(t)	F(p)
u(t)	$1/p$
$\delta(t)$	1
$\dfrac{t^{n-1}}{(n-1)!}$	$\dfrac{1}{p^n}$ $n \geq 1$
e^{-at}	$\dfrac{1}{p+a}$
te^{-at}	$\dfrac{1}{(p+a)^2}$
$\dfrac{e^{-at} - e^{-bt}}{b-a}$	$\dfrac{1}{(p+a)(p+b)}$
sin at	$\dfrac{a}{p^2+a^2}$
cos at	$\dfrac{p}{p^2+a^2}$
e^{-at} sin bt	$\dfrac{b}{(p+a)^2+b^2}$
e^{-at} cos bt	$\dfrac{p+a}{(p+a)^2+b^2}$
sinh at	$\dfrac{a}{p^2-a^2}$
cosh at	$\dfrac{p}{p^2-a^2}$

Eigenschappen van Laplace-getransformeerde funkties

$\mathcal{L}(e^{cx}f(x)) = F(p-c)$ als $\mathcal{L}(f(x)) = F(p)$

$\mathcal{L}(f(cx)) = \dfrac{1}{c} F\left(\dfrac{p}{c}\right)$ als $\mathcal{L}(f(x)) = F(p)$

$\mathcal{L}(f'(x)) = pF(p) - f(0)$ als $\mathcal{L}(f(x)) = F(p)$

$\mathcal{L}(xf(x)) = -F'(p)$ als $\mathcal{L}(f(x)) = F(p)$