28. 1. 04

Goniometrie

$\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$

$\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$

$\sin 2x = 2 \sin x \cos x$

$\cos 2x = \cos^2 x - \sin^2 x = (2\cos^2 x) - 1 = 1 - 2\sin^2 x$

$\Longrightarrow \sin^2 x = \frac{1-\cos 2x}{2} \qquad \cos^2 x = \frac{1+\cos 2x}{2}$

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

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

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

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

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

$\sin^2 \frac{z}{2} = \frac{1-\cos z}{2}$

$\cos^2 \frac{z}{2} = \frac{1+\cos z}{2}$

$\sin^2 + \cos^2 = \text{const } 1$

$\tan = \frac{\sin}{\cos}$

$\sin\left(\frac{\pi}{2} - x\right) = \cos x$

$\cos\left(\frac{\pi}{2} - x\right) = \sin x$

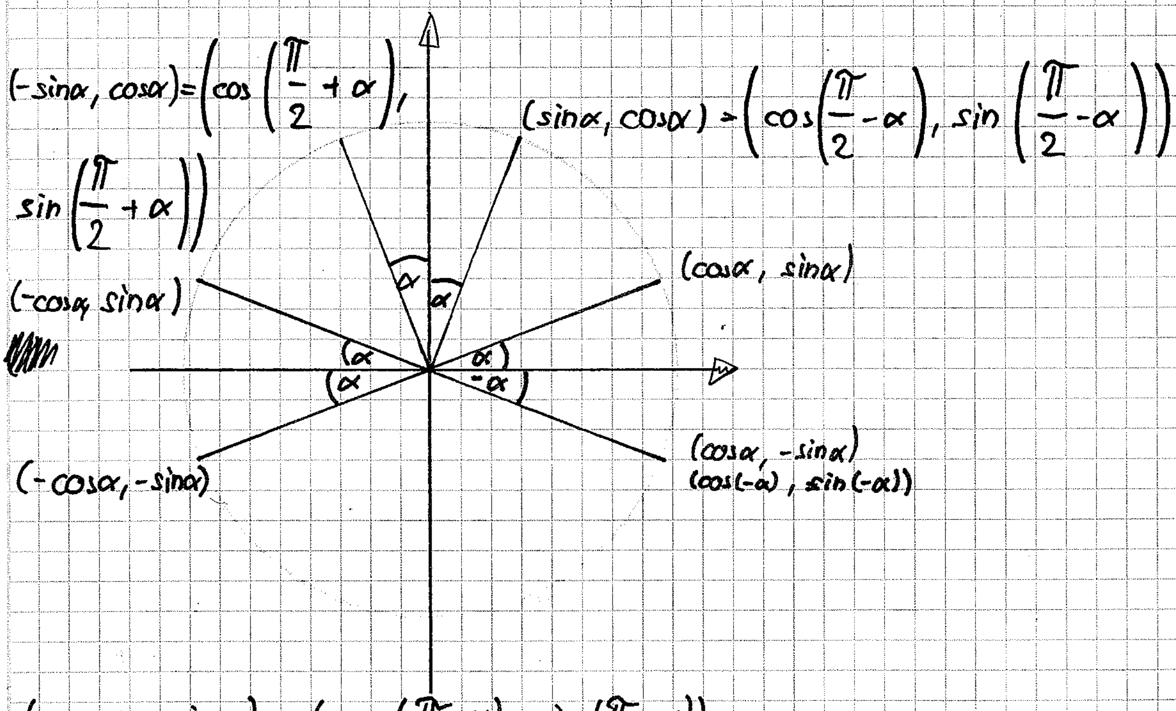
$\sin(-z) = -\sin z$

$\cos(-z) = \cos z$

$\cos a \cdot \sin b = \frac{1}{2}\left(\sin(a+b) - \sin(a-b)\right)$

$\tan^2 \frac{t}{2} = \frac{1-\cos t}{1+\cos t} = \frac{\sin^2 t}{(1+\cos t)^2} = \frac{(1-\cos t)^2}{\sin^2 t}$

	sin	cos	tan	cotan
0	0	1	0	∞ nicht def
$\pi/6$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$	$\sqrt{3}$
$\pi/4$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1	1
$\pi/3$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$	$\frac{1}{\sqrt{3}}$
$\pi/2$	1	0	∞ nicht def.	0



$(-\cos\alpha, \sin\alpha) = (\cos(\pi-\alpha), \sin(\pi-\alpha))$

$(-\cos\alpha, -\sin\alpha) = (\cos(\pi+\alpha), \sin(\pi+\alpha))$