

## Trigonometrisiä kaavoja

$$(1) \quad \sin^2 x + \cos^2 x = 1$$

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

$$(3) \quad \sin(\pi - x) = \sin x, \quad \cos(\pi - x) = -\cos x, \\ \tan(\pi - x) = -\tan x, \quad \cot(\pi - x) = -\cot x$$

$$(4) \quad \sin(x \pm y) = \sin x \cos y \pm \cos x \sin y, \\ \cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$$

$$(5) \quad \tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}, \\ \cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$$

$$(6) \quad \sin 2x = 2 \sin x \cos x, \\ \cos 2x = \cos^2 x - \sin^2 x = 1 - 2 \sin^2 x = 2 \cos^2 x - 1, \\ \tan 2x = \frac{2 \tan x}{1 - \tan^2 x}, \\ \cot 2x = \frac{\cot^2 x - 1}{2 \cot x}$$

$$(7) \quad \sin x \pm \sin y = 2 \sin \frac{x \pm y}{2} \cos \frac{x \mp y}{2}, \\ \cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2}, \\ \cos x - \cos y = -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2}.$$

$$(8) \quad y = \overline{arcsin} x, x \in [-1, 1] \Leftrightarrow \sin y = x, y \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right].$$

$$(9) \quad y = \overline{arccos} x, x \in [-1, 1] \Leftrightarrow \cos y = x, y \in [0, \pi].$$

$$(10) \quad y = \overline{arctan} x, x \in \mathbb{R} \Leftrightarrow \tan y = x, y \in \left]-\frac{\pi}{2}, \frac{\pi}{2}\right[.$$