

Karta wzorów trygonometrycznych

α	$0/0^\circ$	$\frac{\pi}{6}/30^\circ$	$\frac{\pi}{4}/45^\circ$	$\frac{\pi}{3}/60^\circ$	$\frac{\pi}{2}/90^\circ$
$\sin \alpha$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
$\cos \alpha$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
$\operatorname{tg} \alpha$	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	–
$\operatorname{ctg} \alpha$	–	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$	0

$$\begin{aligned} \sin(\pi - \alpha) &= \sin \alpha & \sin(-\alpha) &= -\sin \alpha & \sin(\alpha + \pi) &= -\sin \alpha & \sin(\alpha + 2k\pi) &= \sin \alpha \\ \cos(\pi - \alpha) &= -\cos \alpha & \cos(-\alpha) &= \cos \alpha & \cos(\alpha + \pi) &= -\cos \alpha & \cos(\alpha + 2k\pi) &= \cos \alpha \end{aligned}$$

$$\begin{aligned} \operatorname{tg}(-\alpha) &= -\operatorname{tg} \alpha \\ \operatorname{ctg}(-\alpha) &= -\operatorname{ctg} \alpha \end{aligned}$$

$$\begin{aligned} \operatorname{tg}(\alpha + k\pi) &= \operatorname{tg} \alpha \\ \operatorname{ctg}(\alpha + k\pi) &= \operatorname{ctg} \alpha \end{aligned}$$

$$\begin{aligned} \sin\left(\frac{\pi}{2} - \alpha\right) &= \cos \alpha \\ \operatorname{tg}\left(\frac{\pi}{2} - \alpha\right) &= \operatorname{ctg} \alpha \end{aligned}$$

$$\begin{aligned} \cos\left(\frac{\pi}{2} - \alpha\right) &= \sin \alpha \\ \operatorname{ctg}\left(\frac{\pi}{2} - \alpha\right) &= \operatorname{tg} \alpha \end{aligned}$$

$$\operatorname{tg} \alpha = \frac{\sin \alpha}{\cos \alpha}$$

$$\operatorname{ctg} \alpha = \frac{\cos \alpha}{\sin \alpha} = \frac{1}{\operatorname{tg} \alpha}$$

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

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$

$$\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$$

$$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$$

$$\sin 2\alpha = 2 \sin \alpha \cos \alpha$$

$$\begin{aligned} \cos 2\alpha &= \cos^2 \alpha - \sin^2 \alpha = \\ &= 2\cos^2 \alpha - 1 = 1 - 2\sin^2 \alpha \end{aligned}$$

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

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

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

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