VZORCE GONIOMETRICKÝCH FUNKCÍ

1. $\sin(x \pm 2k\pi) = \sin x$
2. $\cos(x \pm 2k\pi) = \cos x$
3. $\operatorname{tg}(x \pm k\pi) = \operatorname{tg} x$
4. $\operatorname{cotg}(x \pm k\pi) = \operatorname{cotg} x$
5. $\sin(\alpha \pm \beta) = \sin\alpha \cdot \cos\beta \pm \sin\beta \cdot \cos\alpha$
6. $\cos(\alpha \pm \beta) = \cos\alpha \cdot \cos\beta \mp \sin\alpha \cdot \sin\beta$
7. $\operatorname{cotg}^2\alpha = \dfrac{\operatorname{cotg}^2\alpha - 1}{2 \cdot \operatorname{cotg}\alpha}$
8. $\sin(-x) = -\sin x$
9. $\cos(-x) = -\cos x$
10. $\operatorname{tg}(-x) = -\operatorname{tg} x$
11. $\operatorname{cotg}(-x) = -\operatorname{cotg} x$
12. $\operatorname{tg}(\alpha \pm \beta) = \dfrac{\operatorname{tg}\alpha \pm \operatorname{tg}\beta}{1 \mp \operatorname{tg}\alpha \cdot \operatorname{tg}\beta}$
13. $\sin 2\alpha = \dfrac{1 - 2\cos 2\alpha}{2}$
14. $\cos 2\alpha = \cos^2\alpha - \sin^2\alpha$
15. $\sin^2 x + \cos^2 x = 1$
16. $\operatorname{tg} x = \dfrac{\sin x}{\cos x}$
17. $\operatorname{tg} x \cdot \operatorname{cotg} x = 1$
18. $\operatorname{cotg} x = \dfrac{\cos x}{\sin x}$
19. $\operatorname{tg} 2\alpha = \dfrac{2 \cdot \operatorname{tg}\alpha}{1 - \operatorname{tg}^2\alpha}$
20. $\cos 2\alpha = \dfrac{1 + 2\cos 2\alpha}{2}$
21. $\sin 2\alpha = \sin\alpha \cdot \cos\alpha$
22. $\operatorname{cotg}(\alpha \pm \beta) = \dfrac{\operatorname{cotg}\alpha \cdot \operatorname{cotg}\beta \mp 1}{\operatorname{cotg}\beta \pm \operatorname{cotg}\alpha}$

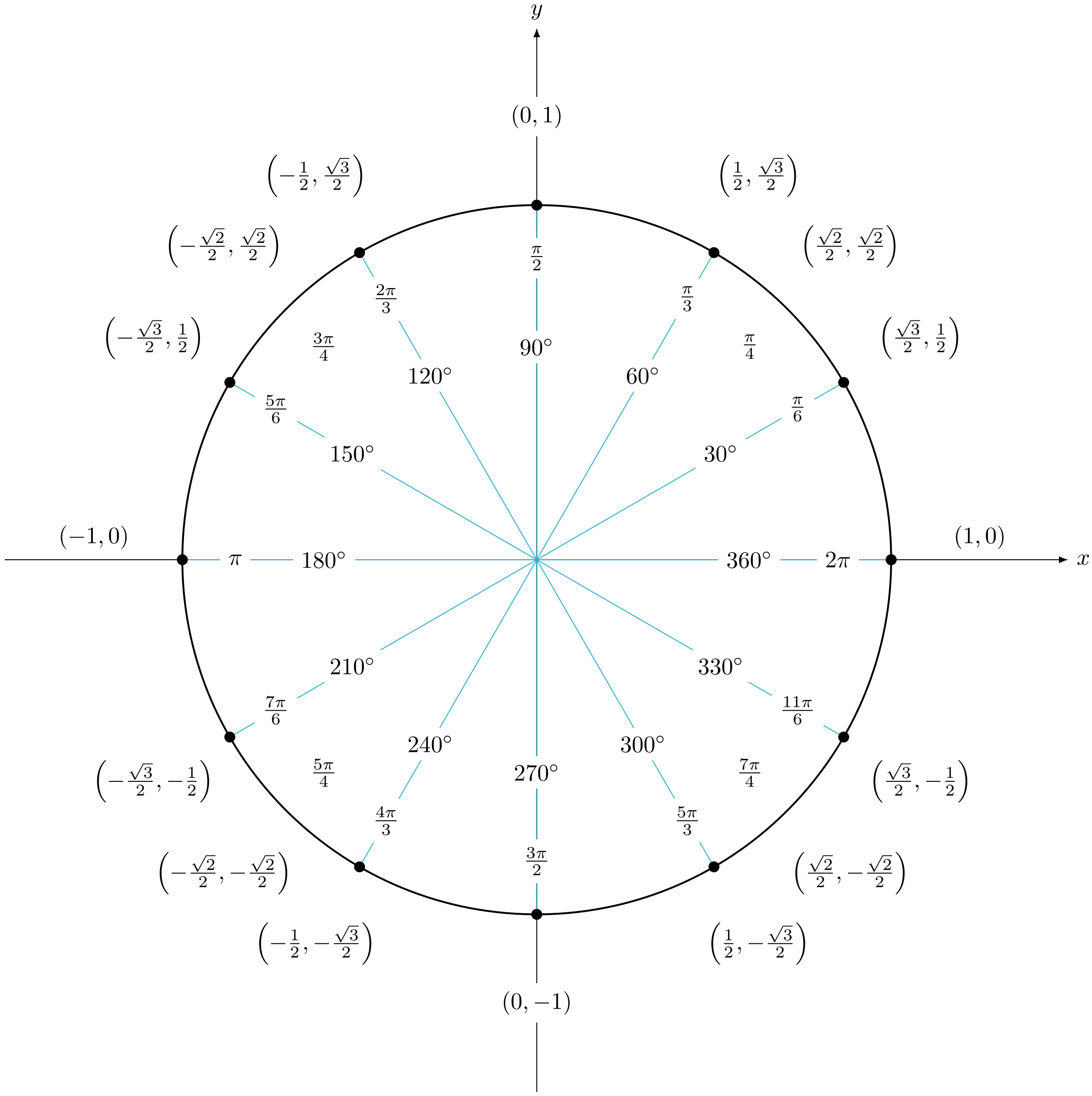
Tabulka 1. Důležité hodnoty goniometrických funkcí

x	$-\frac{\pi}{2}$	$-\frac{\pi}{3}$	$-\frac{\pi}{4}$	$-\frac{\pi}{6}$	$\mathbf{0}$	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π	$\frac{7\pi}{6}$	$\frac{5\pi}{4}$	$\frac{4\pi}{3}$	$\frac{3\pi}{2}$	$\frac{5\pi}{3}$	$\frac{7\pi}{4}$	$\frac{11\pi}{6}$
$\sin x$	-1	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$	$\mathbf{0}$	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	$\mathbf{0}$	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	-1	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$
$\cos x$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$\mathbf{1}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	$\mathbf{-1}$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
$\operatorname{tg} x$	$\star$	$-\sqrt{3}$	-1	$-\frac{\sqrt{3}}{3}$	$\mathbf{0}$	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	$\star$	$-\sqrt{3}$	-1	$-\frac{\sqrt{3}}{3}$	$\mathbf{0}$	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	$\star$	$-\sqrt{3}$	-1	$-\frac{\sqrt{3}}{3}$
$\operatorname{cotg} x$	0	$-\frac{\sqrt{3}}{3}$	-1	$-\sqrt{3}$	$\star$	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$	0	$-\frac{\sqrt{3}}{3}$	-1	$-\sqrt{3}$	$\star$	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$	0	$-\frac{\sqrt{3}}{3}$	-1	$-\sqrt{3}$

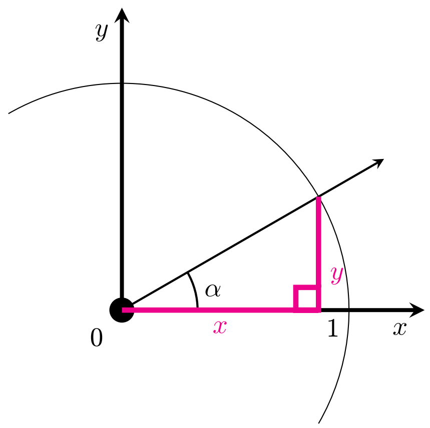
Tabulka 2. Jak odvodíme z tabulky goniometrických funkcí hodnoty cyklometrických funkcí

$\arcsin x$:	$x \in \langle -1; 1\rangle$	$\sin\left(\frac{-\pi}{2}\right)$	$=$	-1	$\Rightarrow$	$\arcsin(-1)$	$=$	$-\frac{\pi}{2}$
	$\arcsin x \in \left\langle \frac{-\pi}{2}; \frac{\pi}{2} \right\rangle$	$\sin\left(\frac{7\pi}{6}\right)$	$=$	$\frac{-1}{2}$	ALE	$\arcsin\left(\frac{-1}{2}\right)$	$=$	$-\frac{\pi}{6}$
$\arccos x$:	$x \in \langle -1; 1\rangle$	$\cos(0)$	$=$	1	$\Rightarrow$	$\arccos(1)$	$=$	0
	$\arccos x \in \langle 0; \pi\rangle$	$\cos\left(\frac{-\pi}{3}\right)$	$=$	$\frac{1}{2}$	ALE	$\arccos\left(\frac{1}{2}\right)$	$=$	$\frac{\pi}{3}$
$\operatorname{arctg} x$:	$x \in (-\infty; \infty)$	$\operatorname{tg}\left(\frac{-\pi}{3}\right)$	$=$	$-\sqrt{3}$	$\Rightarrow$	$\operatorname{arctg}(-\sqrt{3})$	$=$	$\left(\frac{-\pi}{3}\right)$
	$\operatorname{arctg} x \in \left(\frac{-\pi}{2}; \frac{\pi}{2}\right)$	$\operatorname{tg}\left(\frac{2\pi}{3}\right)$	$=$	$-\sqrt{3}$	ALE	$\operatorname{arctg}(-\sqrt{3})$	$=$	$\left(\frac{-\pi}{3}\right)$
		$\operatorname{tg}\left(\frac{5\pi}{3}\right)$	$=$	$-\sqrt{3}$	ALE	$\operatorname{arctg}(-\sqrt{3})$	$=$	$\left(\frac{-\pi}{3}\right)$
$\operatorname{arccotg} x$:	$x \in (-\infty; \infty)$	$\operatorname{cotg}\left(\frac{\pi}{4}\right)$	$=$	1	$\Rightarrow$	$\operatorname{arccotg}(1)$	$=$	$\frac{\pi}{4}$
	$\operatorname{arccotg} x \in (0; \pi)$	$\operatorname{cotg}\left(\frac{5\pi}{4}\right)$	$=$	1	ALE	$\operatorname{arccotg}(1)$	$=$	$\frac{\pi}{4}$

Obrázek 1. Jednotková kružnice – hodnoty úhlů ve stupních



Obrázek 2. Jednotková kružnice



$$\sin\alpha = y \qquad \cos\alpha = x$$
$$\operatorname{tg}\alpha = \frac{y}{x} \qquad \operatorname{cotg}\alpha = \frac{y}{x}$$
$$\sec\alpha = \frac{1}{x} \qquad \csc\alpha = \frac{1}{y}$$