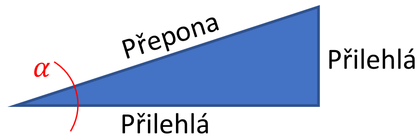
GONIOMETRIE

Orientovaný úhel

- Dvě polopřímky
    - Počáteční rameno
        - Z bodu P (vrchol úhlu) přes bod A
    - Koncové rameno
        - Z bodu P (vrchol úhlu) přes bod B
- Úhlové jednotky
    - Stupně
        - α (°)
        - $\alpha = 30°$
    - Radiány
        - a (rad)
        - $\mathrm{a} = \frac{\pi}{6}$ rad
- Úhel se periodicky opakuje
    - $\alpha + k \cdot 360°, k \in Z$
    - $\mathrm{a} + 2\mathrm{k}\pi, \mathrm{k} \in \mathrm{Z}$
- Tabulka nejčastějších úhlů

α (°)	0	30	45	60	90	180	270	360
a (rad)	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π

- $\sin(\alpha)$, $\cos(\alpha)$, $\mathrm{tg}(\alpha)$, $\mathrm{cotg}(\alpha)$
    - 

    - $\sin\alpha = \frac{\text{Protilehlá}}{\text{Přepona}}$
    - $\cos\alpha = \frac{\text{Přilehlá}}{\text{Přepona}}$
        - $\mathrm{D}(f) = \mathrm{R}$
        - $\mathrm{H}(f) = \langle -1;\ 1\rangle$

    - $\mathrm{tg}\,\alpha = \frac{\sin\alpha}{\cos\alpha}$
    - $\mathrm{cotg}\,\alpha = \frac{\cos\alpha}{\sin\alpha}$
        - $\mathrm{D}(f) = \mathrm{R} \backslash \left\{\frac{(2\mathrm{k}+1)\pi}{2}, \mathrm{k} \in \mathrm{Z}\right\}$
        - $\mathrm{H}(f) = \mathrm{R}$

°	0	30	45	60	90	180	270	360
rad	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$\sin\alpha$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1	0	-1	0
$\cos\alpha$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0	-1	0	1
$\mathrm{tg}\,\alpha$	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	-	0	-	0
$\mathrm{cotg}\,\alpha$	-	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$	0	-	0	-

2	1
3	4

$\sin x$

+	+
-	-

$\cos x$

-	+
-	+

$\mathrm{tg}\, x$
$\mathrm{cotg}\, x$

-	+
+	-

CYKLOMETRICKÉ FUNKCE

$$y = \arcsin(x) \quad \text{-->} \quad x = \sin(y)$$

GONIOMETRICKÉ ROVNICE

$$\sin(x) = a \qquad \cos(x) = a \qquad a \in \langle -1;\ 1\rangle$$
$$\mathrm{tg}(x) = b \qquad \mathrm{cotg}(x) = b \qquad b \in R$$

! NEKONEČNĚ MNOHO ŘEŠENÍ !

1)

$\sin x = 0$
$x_1 = 0$
$x_2 = \pi$
$x_3 = 2\pi$
$\vdots$
$x \epsilon \{k \cdot \pi, k \epsilon Z\}$

2)

$\cos x = 0$
$x_1 = \frac{\pi}{2}$
$x_2 = \frac{3\pi}{2}$
$x_3 = \frac{5\pi}{2}$
$\vdots$
$x \epsilon \left\{\frac{(2k+1)\pi}{2}, k \epsilon Z\right\}$

3)

$\mathrm{tg}\, x = 0$

$\frac{\sin\alpha}{\cos\alpha} = 0$

$\sin x = 0$

$\vdots$

$x \epsilon \{k \cdot \pi, k\epsilon Z\}$

4)

$\mathrm{cotg}\, x = 0$

$\frac{\cos\alpha}{\sin\alpha} = 0$

$\cos x = 0$

$\vdots$

$x \epsilon \left\{\frac{(2k+1)\pi}{2}, k\epsilon Z\right\}$

5)

$\sin x = 1$

$x_1 = \frac{\pi}{2}$

$x_2 = \frac{5\pi}{2}$

$x_3 = \frac{9\pi}{2}$

$\vdots$

$x \epsilon \left\{\frac{(4k+1)\pi}{2}, k\epsilon Z\right\}$

6)

$\sin x = -1$

$x_1 = \frac{3\pi}{2}$

$x_2 = \frac{7\pi}{2}$

$x_3 = \frac{11\pi}{2}$

$\vdots$

$x \epsilon \left\{\frac{(4k+3)\pi}{2}, k\epsilon Z\right\}$

7)

$\cos \mathrm{x}=1$
$\mathrm{x}_1=0$
$\mathrm{x}_2=2\pi$
$\mathrm{x}_3=4\pi$
$\vdots$
$x\epsilon\{2\mathrm{k}\pi, \mathrm{k}\epsilon\mathrm{Z}\}$

8)

$\cos \mathrm{x}=-1$
$\mathrm{x}_1=\pi$
$\mathrm{x}_2=3\pi$
$\mathrm{x}_3=5\pi$
$\vdots$
$x\epsilon\{(2k+1)\pi, k\epsilon Z\}$

9)

$\sin \mathrm{x}=\frac{1}{2}$
$\mathrm{x}_1=\frac{\pi}{6}$
$\mathrm{x}_2=\frac{5\pi}{6}$
$\mathrm{x}_3=\frac{13\pi}{6}$
$\vdots$
$x\epsilon\left\{\frac{(12\mathrm{k}+1)\pi}{6}, \mathrm{k}\epsilon\mathrm{Z}\right\}\cup\left\{\frac{(12\mathrm{k}+5)\pi}{6}, \mathrm{k}\epsilon\mathrm{Z}\right\}$

10)

$\cos \mathrm{x}=\frac{1}{2}$
$\mathrm{x}_1=\frac{\pi}{3}$
$\mathrm{x}_2=\frac{5\pi}{3}$
$\mathrm{x}_3=\frac{7\pi}{3}$
$\vdots$
$x\epsilon\left\{\frac{(6\mathrm{k}+1)\pi}{3}, \mathrm{k}\epsilon\mathrm{Z}\right\}\cup\left\{\frac{(6\mathrm{k}+5)\pi}{3}, \mathrm{k}\epsilon\mathrm{Z}\right\}$