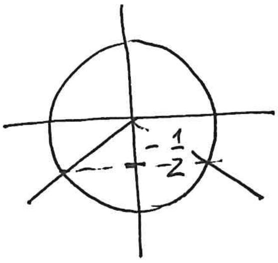
Cvičení 5

1.

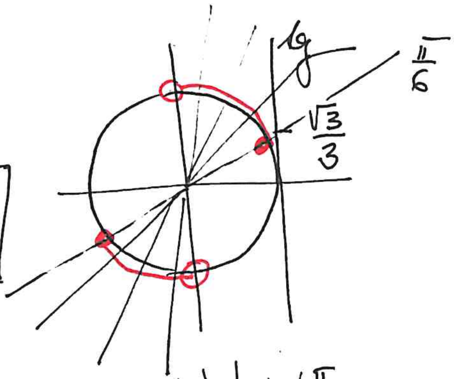


$$\boxed{\begin{aligned} x_1 &= \frac{7\pi}{6} \\ x_2 &= \frac{11\pi}{6} \end{aligned}}$$

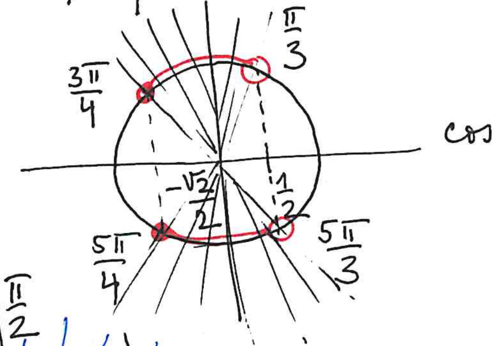
2. $\boxed{x \in \left(\frac{7\pi}{6}; \frac{11\pi}{6}\right)}$

3.

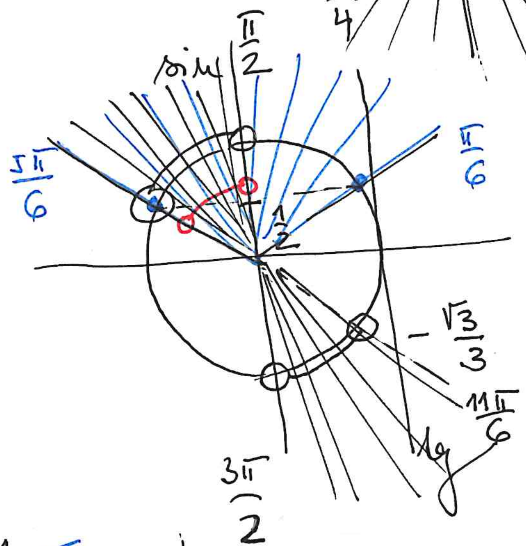
- $\boxed{x \in \left\langle \frac{\pi}{6}; \frac{\pi}{2} \right) \cup \left\langle \frac{7\pi}{6}; \frac{3\pi}{2} \right)}$



- $\boxed{x \in \left(\frac{\pi}{3}; \frac{3\pi}{4} \right\rangle \cup \left\langle \frac{5\pi}{4}; \frac{5\pi}{3} \right)}$

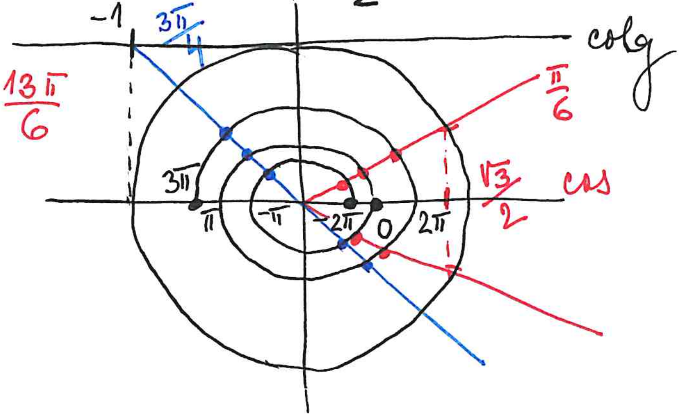


- $\boxed{x \in \left(\frac{\pi}{2}; \frac{5\pi}{6} \right)}$



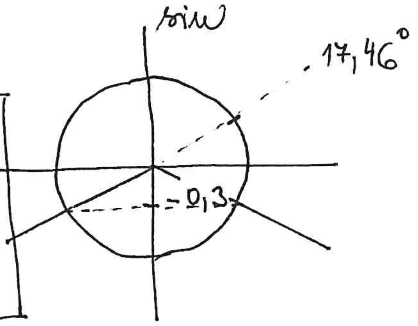
4.

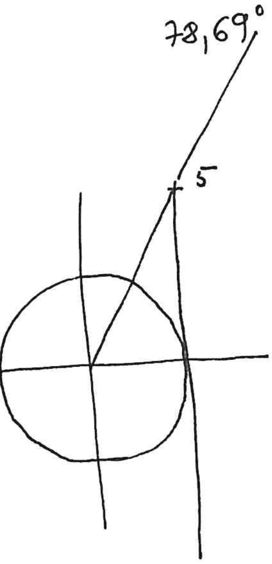
- $x = -\frac{5\pi}{4}; -\frac{\pi}{4}; \frac{3\pi}{4}; \frac{7\pi}{4}; \frac{11\pi}{4}$
- $x = -\frac{11\pi}{6}; -\frac{\pi}{6}; \frac{\pi}{6}; \frac{11\pi}{6}; \frac{13\pi}{6}$



5.

- $$\boxed{\begin{aligned} x_1 &\doteq 197{,}46^\circ + k\cdot 360^\circ \\ x_2 &\doteq 342{,}54^\circ + k\cdot 360^\circ \\ &k\in \mathbb{Z} \end{aligned}}$$





- $$\boxed{x = 78{,}69^\circ + k\cdot 180^\circ;\ k\in\mathbb{Z}}$$

- neexistuje

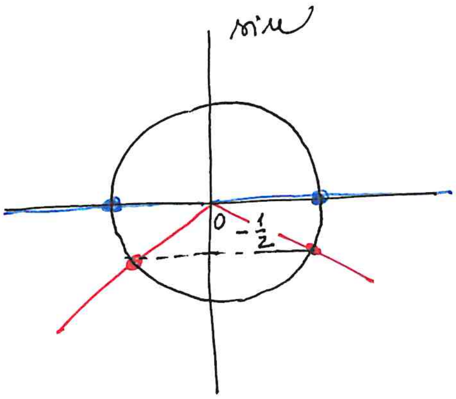
6.

- $2\cdot \sin^2 x + \sin x = 0$

  $\sin x\,(2\sin x + 1) = 0 \iff$

  $\sin x = 0 \ \vee\ \sin x = -\frac{1}{2}$

  $$\boxed{\begin{aligned} x_1 &= k\cdot\pi \\ x_2 &= \frac{7\pi}{6} + 2k\pi \qquad k\in\mathbb{Z} \\ x_3 &= \frac{11\pi}{6} + 2k\pi \end{aligned}}$$

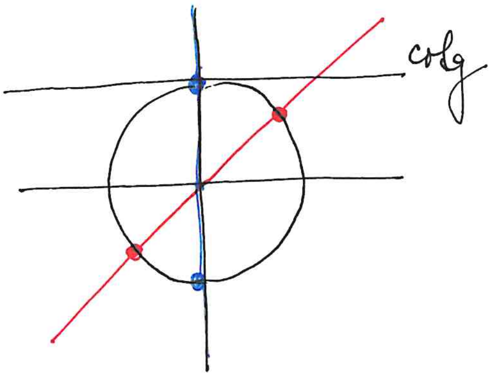


- $\mathrm{cotg}^2 x - \mathrm{cotg}\, x = 0$

  $\mathrm{cotg}\, x\,(\mathrm{cotg}\, x - 1) = 0 \iff$

  $\mathrm{cotg}\, x = 0 \ \vee\ \mathrm{cotg}\, x = 1$

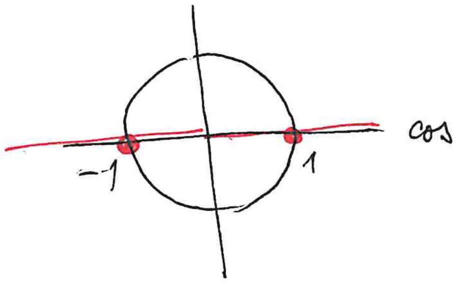
  $$\boxed{\begin{aligned} x_1 &= \frac{\pi}{4} + k\cdot\pi \qquad k\in\mathbb{Z} \\ x_2 &= \frac{\pi}{2} + k\cdot\pi \end{aligned}}$$



- $\cos^2 x = 1$

  $\cos x = \pm 1$

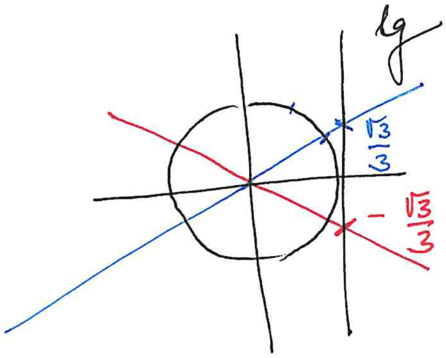
  $\boxed{x = k\cdot\pi;\ k\in Z}$



- $\text{tg}^2 x = \frac{1}{3} \longrightarrow$

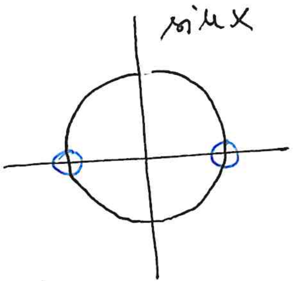
  $\text{tg}\, x = \pm\frac{1}{\sqrt{3}} = \pm\frac{\sqrt{3}}{3}$

  $$\boxed{\begin{matrix} x_1 = \frac{\pi}{6} + k\cdot\pi \\ x_2 = \frac{5\pi}{6} + k\cdot\pi \end{matrix} \quad k\in Z}$$



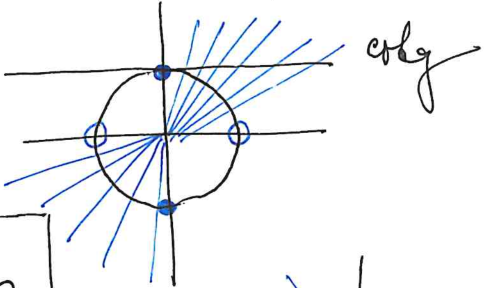
4. - $\sin x \neq 0 \longrightarrow x \neq$

     $\boxed{Df = R - \{k\cdot\pi;\ k\in Z\}}$



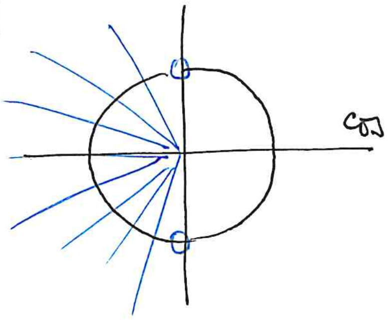
   - $\text{cotg}\, x \geq 0$

     $\boxed{Df = \left(0 + k\cdot\pi;\ \frac{\pi}{2} + k\cdot\pi\right\rangle \ k\in Z}$



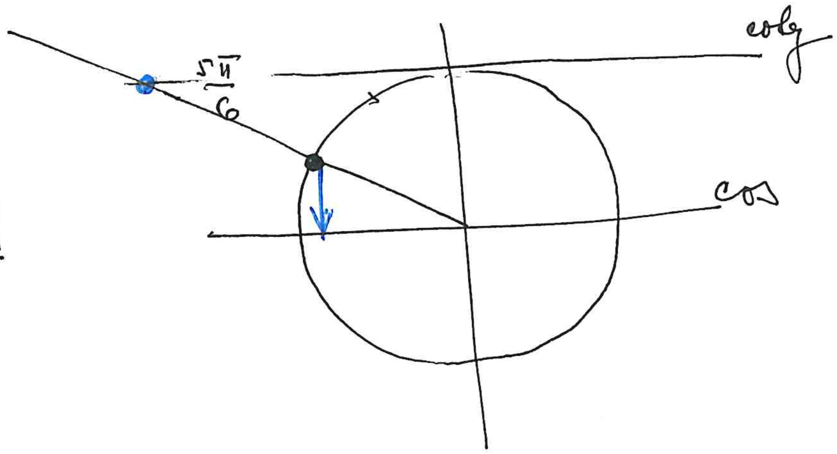
   - $\cos x < 0$

     $\boxed{x \in \left(\frac{\pi}{2} + 2k\pi;\ \frac{3\pi}{2} + 2k\pi\right) \ k\in Z}$



8.

- $\boxed{\operatorname{cotg}\frac{5\pi}{6} < \cos\frac{5\pi}{6}}$



- $\boxed{\cos(-380^\circ) = \cos 740^\circ}$