

## Úkol na matiku 10. 6.

**Zadání.** Řešte goniometrické rovnice v oboru  $\mathbb{R}$ .

1.

$$\sin(x) = \frac{\sqrt{2}}{2}$$
$$x \in \left\{ \frac{\pi}{4} + 2k\pi \mid k \in \mathbb{Z} \right\} \cup \left\{ \frac{3}{4}\pi + 2k\pi \mid k \in \mathbb{Z} \right\}$$

2.

$$\cos(x) = \frac{\sqrt{3}}{2}$$
$$x \in \left\{ \frac{\pi}{6} + 2k\pi \mid k \in \mathbb{Z} \right\} \cup \left\{ \frac{11}{6}\pi + 2k\pi \mid k \in \mathbb{Z} \right\}$$

3.

$$\sin(x) = 1$$
$$x \in \left\{ \frac{\pi}{2} + 2k\pi \mid k \in \mathbb{Z} \right\}$$

4.

$$-2 \cos(x) - \sqrt{3} = 0$$
$$\cos(x) = -\frac{\sqrt{3}}{2}$$
$$x \in \left\{ \frac{5}{6}\pi + 2k\pi \mid k \in \mathbb{Z} \right\} \cup \left\{ \frac{7}{6}\pi + 2k\pi \mid k \in \mathbb{Z} \right\}$$

5.

$$7 \cos(x) = 0$$
$$\cos(x) = 0$$
$$x \in \{k\pi \mid k \in \mathbb{Z}\}$$

6.

$$\sin(x) = -\frac{1}{2}$$
$$x \in \left\{ \frac{7}{6}\pi + 2k\pi \mid k \in \mathbb{Z} \right\} \cup \left\{ \frac{11}{6}\pi + 2k\pi \mid k \in \mathbb{Z} \right\}$$

7.

$$\frac{1 + 4 \sin(x)}{3} = -1$$
$$4 \sin(x) = -4$$
$$\sin(x) = -1$$
$$x \in \left\{ \frac{3}{2}\pi + 2k\pi \mid k \in \mathbb{Z} \right\}$$

8.

$$\begin{aligned} -\sin(x) &= \frac{\sqrt{2}}{2} \\ \sin(x) &= -\frac{\sqrt{2}}{2} \\ x &\in \left\{ \frac{5}{4}\pi + 2k\pi \mid k \in \mathbb{Z} \right\} \cup \left\{ \frac{7}{4}\pi + 2k\pi \mid k \in \mathbb{Z} \right\} \end{aligned}$$

9.

$$\begin{aligned} 3 + 2\cos(x) &= -\frac{3}{2} \\ 2\cos(x) &= -\frac{9}{2} \\ \cos(x) &= -\frac{9}{4} \\ \cos(x) < -1 &\implies x \notin \mathbb{R} \end{aligned}$$

10.

$$\begin{aligned} \operatorname{tg}(x) &= 1 \\ x &\in \left\{ \frac{\pi}{4} + k\pi \mid k \in \mathbb{Z} \right\} \end{aligned}$$

11.

$$\begin{aligned} \frac{\operatorname{tg}(x)}{\sqrt{3}} &= \frac{1}{3} \\ \operatorname{tg}(x) &= \frac{\sqrt{3}}{3} \\ x &\in \left\{ \frac{\pi}{6} + k\pi \mid k \in \mathbb{Z} \right\} \end{aligned}$$

12.

$$\begin{aligned} \frac{9 + 6\operatorname{tg}(x)}{3} &= 1 \\ 6\operatorname{tg}(x) &= -6 \\ \operatorname{tg}(x) &= -1 \\ x &\in \left\{ \frac{3\pi}{4} + k\pi \mid k \in \mathbb{Z} \right\} \end{aligned}$$

13.

$$\begin{aligned} \operatorname{cotg}(x) &= \frac{\sqrt{3}}{3} \\ x &\in \left\{ \frac{\pi}{3} + k\pi \mid k \in \mathbb{Z} \right\} \end{aligned}$$

14.

$$\begin{aligned} \operatorname{cotg}(x) &= 0 \\ x &\in \left\{ \frac{\pi}{2} + k\pi \mid k \in \mathbb{Z} \right\} \end{aligned}$$

**Zadání.** Řešte rovnice v  $\mathbb{R}$ . Výsledky pište ve stupňové míře.

1.

$$\begin{aligned}\sin(x) &= \frac{1}{2} \\ x &\in \{30^\circ + k360^\circ \mid k \in \mathbb{Z}\} \cup \{150^\circ + k360^\circ \mid k \in \mathbb{Z}\}\end{aligned}$$

2.

$$\begin{aligned}\cos(x) &= -\frac{1}{2} \\ x &\in \{120^\circ + k360^\circ \mid k \in \mathbb{Z}\} \cup \{240^\circ + k360^\circ \mid k \in \mathbb{Z}\}\end{aligned}$$

3.

$$\begin{aligned}2 \cos(x) &= \sqrt{2} \\ \cos(x) &= \frac{\sqrt{2}}{2} \\ x &\in \{45^\circ + k360^\circ \mid k \in \mathbb{Z}\} \cup \{315^\circ + k360^\circ \mid k \in \mathbb{Z}\}\end{aligned}$$

4.

$$\begin{aligned}-\operatorname{tg}(x) &= 1 \\ \operatorname{tg}(x) &= -1 \\ x &\in \{135^\circ + k180^\circ \mid k \in \mathbb{Z}\}\end{aligned}$$

5.

$$\begin{aligned}2 \sin(x) &= 0 \\ \sin(x) &= 0 \\ x &\in \{k180^\circ \mid k \in \mathbb{Z}\}\end{aligned}$$

6.

$$\begin{aligned}\frac{3 \cotg(x)}{\sqrt{3}} &= 1 \\ \cotg(x) &= \frac{\sqrt{3}}{3} \\ x &\in \{60^\circ + k180^\circ \mid k \in \mathbb{Z}\}\end{aligned}$$