

29. Goniometrické rovnice

- 1) $1 + \sin x - \cos x - \operatorname{tg} x = 0$
- 2) $6 \sin^2 x - 7 \sin 2x + 8 \cos^2 x = 0$
- 3) $\sin x + \sin 3x = \cos 2x + \cos 4x$
- 4) $1 - \operatorname{tg} x + \operatorname{tg}^2 x - \dots = \frac{\operatorname{tg} 2x}{1 + \operatorname{tg} 2x}, x \in (0; \pi)$
- 5) $\frac{\sin^2 x}{\operatorname{tg} x} + \cos^2 x \cdot \operatorname{tg} x = 1$
- 6) $\sin x + \sin 2x + \sin 3x = 0$
- 7) $\sin^2 \pi x + \log_2^2(x^2 - 3x + 1) = 0$
- 8) $2 \cdot \sin x = \sqrt{3} \cdot \operatorname{tg} x$
- 9) $\sqrt{3} \operatorname{tg}^2 x + 2 \operatorname{tg} x - \sqrt{3} = 0$
- 10) $\sin x + \sin 2x + \sin 3x = 1 + \cos x + \cos 2x$
- 11) $\operatorname{tg} 3x - \operatorname{tg} x = 4 \sin x$
- 12) $\operatorname{tg}^3 x + \operatorname{tg}^2 x = 1 + \operatorname{tg} x$
- 13) $\frac{1}{\sin^2 x} + \operatorname{cotg} x - 1 = 0$
- 14) $\cos(x + 50^\circ) + \cos(x + 10^\circ) = 1,2$
- 15) Určete úhly v pravoúhlém trojúhelníku, jestliže pro strany platí:
 $5a + 3b = 4c\sqrt{2}$
- 16) V intervalu $\langle 0; 2\pi \rangle$ řešte nerovnice:
 - a) $\sin x + \cos 2x > 1$
 - b) $\sin x \geq -\frac{1}{2}$
 - c) $\sin x > \frac{1}{\sin x}$
 - d) $\operatorname{cotg}^2 2x \geq \frac{1}{3}$
- 17) $6 \sin x - 3 \cos x = 5$
- 18) Určete úhly v pravoúhlém trojúhelníku, jestliže pro strany platí:
 $8a + 6b = 9c$
- 19) $2 \sin^2 x + \sin^2 2x = 2$
- 20) $\sin 7x + \sin x = \cos 3x$

Výsledky (29. Goniometrické rovnice)

- 1) $x_1 = 2k\pi, x_2 = \frac{\pi}{4} + k\pi$
- 2) $x_1 = 53^\circ 08' + k \cdot 180^\circ; x_2 = 45^\circ + k \cdot 180^\circ$
- 3) $x_1 = 90^\circ + k \cdot 180^\circ; x_2 = 18^\circ + k \cdot 360^\circ; x_3 = 162^\circ + k \cdot 360^\circ; x_4 = 306^\circ + k \cdot 360^\circ;$
 $x_5 = 234^\circ + k \cdot 360^\circ$
- 4) $x_1 = \frac{\pi}{6} + k\pi, x_2 = \frac{5\pi}{6} + k\pi$
- 5) $x = \frac{\pi}{4} + k\pi$
- 6) $x_1 = k\frac{\pi}{2}, x_2 = \frac{2\pi}{3} + k2\pi, x_3 = \frac{4\pi}{3} + k2\pi$
- 7) $x_1 = 0, x_2 = 3$
- 8) $x_1 = k\pi, x_2 = \frac{\pi}{6} + k2\pi, x_3 = \frac{11\pi}{6} + k2\pi$
- 9) $x_1 = \frac{\pi}{6} + k\pi, x_2 = \frac{2\pi}{3} + k\pi$
- 10) $x_1 = \frac{2\pi}{3} + k2\pi; x_2 = \frac{4\pi}{3} + k2\pi; x_3 = \frac{\pi}{2} + k\pi; x_4 = \frac{\pi}{6} + k2\pi; x_5 = \frac{5\pi}{6} + k2\pi$
- 11) $x_1 = \frac{\pi}{9} + 2k\frac{\pi}{3}, x_2 = \frac{5\pi}{9} + 2k\frac{\pi}{3}, x_3 = k\pi$
- 12) $x_1 = \frac{\pi}{4} + k\pi, x_2 = -\frac{\pi}{4} + k\pi$
- 13) $x_1 = \frac{\pi}{2} + k\pi, x_2 = \frac{3\pi}{4} + k\pi$
- 14) $x_1 = 20^\circ 19' + k \cdot 360^\circ; x_2 = 339^\circ 41' + k \cdot 360^\circ$
- 15) $\alpha_1 = \beta_1 = 45^\circ, \chi_1 = 90^\circ;$
 $\alpha_2 = 73^\circ 06', \beta_2 = 16^\circ 56'$
- 16)
 - a) $x \in \left(0, \frac{\pi}{6}\right) \cup \left(0, \frac{\pi}{2}\right)$
 - b) $x \in \left(0, \frac{7\pi}{6}\right) \cup \left(\frac{11\pi}{6}, 2\pi\right)$
 - c) $x \in \left(\pi, \frac{3\pi}{2}\right) \cup \left(\frac{3\pi}{2}, 2\pi\right)$
 - d) $x \in \bigcup_{k \in \mathbb{Z}} \left[\left(k\frac{\pi}{2}, \frac{\pi}{6} + k\frac{\pi}{2} \right) \cup \left(\frac{\pi}{3} + k\frac{\pi}{2}, \frac{\pi}{2} + k\frac{\pi}{2} \right) \right]$
- 17) $x_1 = 74^\circ 45' + k \cdot 360^\circ; x_2 = 158^\circ 23' + k \cdot 360^\circ$
- 18) $\alpha_1 \doteq 24^\circ, \beta_1 \doteq 66^\circ, \chi_1 = 90^\circ;$
 $\alpha_2 \doteq 80^\circ, \beta_2 \doteq 10^\circ, \chi_2 = 90^\circ$

$$19) \quad x_1 = \frac{\pi}{2} + k\pi, x_2 = \frac{\pi}{4} + k\frac{\pi}{2}$$

$$20) \quad x_1 = \frac{\pi}{6} + k\frac{\pi}{3}, x_2 = \frac{5\pi}{24} + k\frac{\pi}{2}, x_3 = \frac{\pi}{24}k\pi + k\frac{\pi}{2}$$