

Goniometria - Uhly, výrazy, rovnice.

- ① Znázorníte na jednotkové kružnici uhly: $1450^\circ, -813^\circ, \frac{22}{3}\pi, \frac{37}{6}\pi, -\frac{41}{4}\pi, -\frac{19}{2}\pi, \frac{97}{4}\pi$
- ② Vypočítejte periodu do 1 kvadrantu hodnoty: $\sin 495^\circ; \cos(-830^\circ); \operatorname{tg} 585^\circ; \operatorname{ctg}(-765^\circ)$
 $\sin(-\frac{25}{4}\pi); \cos \frac{53}{6}\pi; \operatorname{tg}(-\frac{29}{3}\pi); \operatorname{ctg} \frac{43}{2}\pi$
- ③ Uveďte hodnoty ostatních goniometrických funkcí $\sin x, \cos x, \operatorname{tg} x, \operatorname{ctg} x, \sin 2x, \cos 2x$,
 ale a) $\sin x = -\frac{12}{13} \wedge x \in (\pi, \frac{3}{2}\pi)$ b) $\operatorname{ctg} x = -\frac{7}{24} \wedge x \in (\frac{3}{2}\pi, 2\pi)$
 c) $\operatorname{tg} x = \frac{1}{2} \wedge x \in (\pi, \frac{3}{2}\pi)$ d) $\cos x = \frac{3}{4} \wedge x \in (0, \frac{\pi}{2})$
- ④ Řešte v \mathbb{R} rovnice: a) $2 \sin x = -\sqrt{2}$ b) $3 \operatorname{tg} x = -\sqrt{3}$ c) $2 \cos(\frac{x}{3} - \frac{\pi}{6}) = \sqrt{2}$
 d) $3 \operatorname{ctg}(4x + \frac{\pi}{4}) = \sqrt{3}$ e) $2 \sin(3x - \frac{\pi}{2}) = 1$ f) $2 \cos(4x - 30^\circ) = -\sqrt{3}$
- ⑤ Řešte v \mathbb{R} pomocí substituce:
 a) $2 \cos^2 x - \cos x - 1 = 0$ b) $2 \sin^2 x - 3 \sin x + 1 = 0$ c) $2 \cos^2 x + 5 \cos x - 3 = 0$
 d) $\operatorname{tg}^2 x - \operatorname{tg} x - 2 = 0$ e) $\sqrt{3} \operatorname{tg}^2 x - 4 \operatorname{tg} x + \sqrt{3} = 0$
- ⑥ Zjednodušte výrazy a uveďte podmínky řešitelnosti (*):
 a) $(\cos x - \sin x)^2 + (\cos x + \sin x)^2$ b) $\sin^2 x \cdot \operatorname{ctg}^2 x + \sin^2 x - 1 =$
 c) $(1 + \operatorname{tg}^2 x) \cdot (1 - \sin^2 x) - \sin^2 x$ d) $\cos 2x + 2 \sin^2 x =$
 e) $\frac{1 + \sin 2x}{(\sin x + \cos x)^2} =$ f) $\frac{\sin 2x + 1}{\cos 2x}$ g) $\frac{\cos 2x}{\sin x + \cos x} =$ h) $\cos x (\operatorname{tg} x + \operatorname{ctg} x) =$
 i) $\frac{1}{1 + \operatorname{tg} x} - \frac{\operatorname{ctg} x}{1 + \operatorname{ctg} x} = [0]$ j) $\frac{1 - \cos 2x - \sin x}{\sin 2x - \cos x} = [\operatorname{tg} x]$ k) $\frac{\sin 2x - \cos 2x - 1}{\sin 2x + \cos 2x - 1} = \frac{\sqrt{3}}{3}$
 l) $\frac{1 + \sin 2x - \cos 2x}{1 + \sin 2x + \cos 2x} = [\operatorname{tg} x]$ m) $\frac{\sin 2x}{1 + \cos 2x} + \frac{1 - \cos 2x}{\sin 2x} = [2 \operatorname{tg} x]$
- ⑦ Řešte v \mathbb{R} rovnice:
 a) $2 \cos^2 x - 3 \sin x - 3 = 0$ b) $\operatorname{ctg} x = 2 \cos x$ c) $1 = \cos 2x - \sin x$
 d) $\cos 2x - 2 = \cos x$ e) $\cos 2x - 3 \sin x = 2$
 f) $\cos 2x + \sin x \cos x = 1$ g) $\sin x + \cos 2x = 1$