

GONIOMETRIE - úvod

Zobrazení množiny R do jednotkové kružnice

Př1 Vyjádřete velikost úhlu ve stupních:

$$a) \frac{5}{4}\pi \quad \alpha = \frac{\frac{5}{4}\pi \cdot 180^{\circ}}{\pi} = \underline{\underline{225^{\circ}}}$$

$$b) \frac{7}{6}\pi \quad \alpha = \frac{\frac{7}{6}\pi \cdot 180^{\circ}}{\pi} = \underline{\underline{210^{\circ}}}$$

$$c) -\frac{4}{3}\pi \quad \alpha = \frac{-\frac{4}{3}\pi \cdot 180^{\circ}}{\pi} = \underline{\underline{-240^{\circ}}}$$

$$d) 5\pi \quad \alpha = \frac{5\pi \cdot 180^{\circ}}{\pi} = \underline{\underline{900^{\circ}}}$$

$$e) \frac{7}{15}\pi \quad \alpha = \frac{\frac{7}{15}\pi \cdot 180^{\circ}}{\pi} = \underline{\underline{84^{\circ}}}$$

$$f) \frac{11}{12}\pi \quad \alpha = \frac{\frac{11}{12}\pi \cdot 180^{\circ}}{\pi} = \underline{\underline{165^{\circ}}}$$

$$g) \frac{13}{5}\pi \quad \alpha = \frac{\frac{13}{5}\pi \cdot 180^{\circ}}{\pi} = \underline{\underline{468^{\circ}}}$$

$$h) -\frac{2}{3}\pi \quad \alpha = \frac{-\frac{2}{3}\pi \cdot 180^{\circ}}{\pi} = \underline{\underline{-120^{\circ}}}$$

$$i) \frac{16}{9}\pi \quad \alpha = \frac{\frac{16}{9}\pi \cdot 180^{\circ}}{\pi} = \underline{\underline{320^{\circ}}}$$

Př2 Vyjádřete velikost úhlu v radiánech:

$$a) 150^{\circ} \quad x = \frac{150 \cdot \pi}{180} = \underline{\underline{\frac{5}{6}\pi}}$$

$$b) 15^{\circ} \quad x = \frac{15 \cdot \pi}{180} = \underline{\underline{\frac{1}{12}\pi}}$$

$$c) -335^{\circ} \quad x = \frac{-335 \cdot \pi}{180} = \underline{\underline{-\frac{67}{36}\pi}}$$

$$d) 300^{\circ} \quad x = \frac{300 \cdot \pi}{180} = \underline{\underline{\frac{5}{3}\pi}}$$

$$e) 225^{\circ} \quad x = \frac{225 \cdot \pi}{180} = \underline{\underline{\frac{5}{4}\pi}}$$

$$f) 420^{\circ} \quad x = \frac{420 \cdot \pi}{180} = \underline{\underline{\frac{7}{3}\pi}}$$

$$g) 147^{\circ} \quad x = \frac{147 \cdot \pi}{180} = \underline{\underline{\frac{49}{60}\pi}}$$

h) -195°

$$x = \frac{-195 \cdot \pi}{180} = \frac{-13}{12} \pi$$

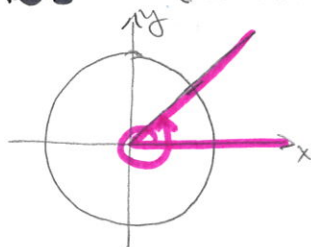
i) 52°

$$x = \frac{52 \cdot \pi}{180} = \frac{13}{45} \pi$$

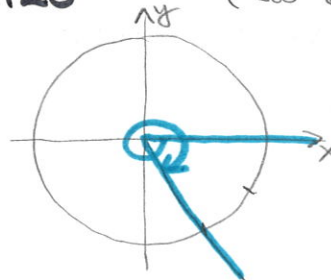
Pr 3

Znážorněte na jednotkové kružnici úhly:

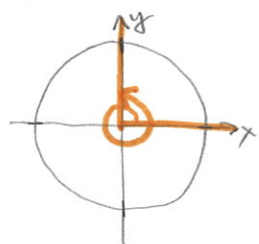
a) 405° ($360^\circ + 45^\circ$)



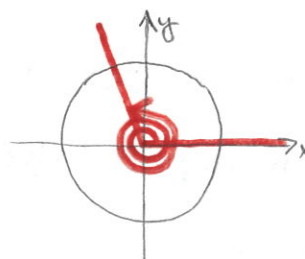
b) -420° ($-360^\circ - 60^\circ$)



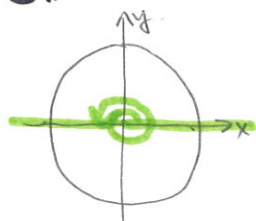
c) $\frac{5}{2}\pi$ ($\frac{4}{2}\pi + \frac{1}{2}\pi$)



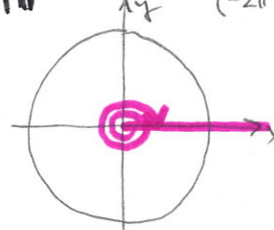
d) 820° ($360^\circ + 360^\circ + 100^\circ$)



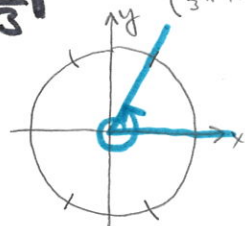
e) 3π ($2\pi + \pi$)



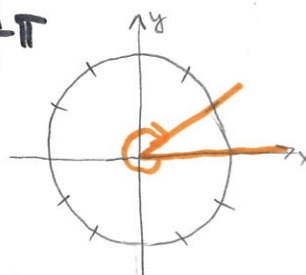
f) -4π ($-2\pi - 2\pi$)



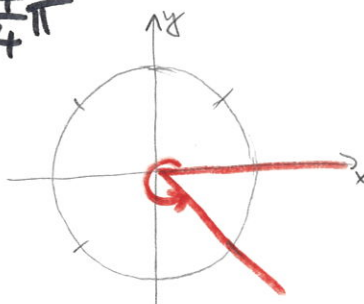
g) $\frac{7}{3}\pi$ ($\frac{6}{3}\pi + \frac{1}{3}\pi$)



h) $-\frac{11}{6}\pi$



i) $\frac{7}{4}\pi$

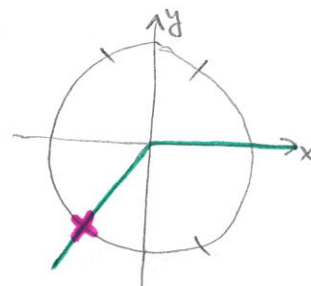
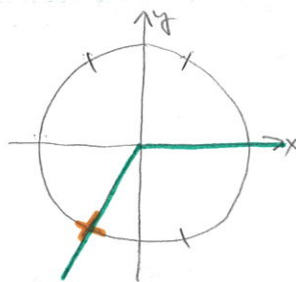


Pr4

Rozhodněte, zda dále uvedeným dvojicám čísel je přiřazen týž bod jednotkové kružnice:

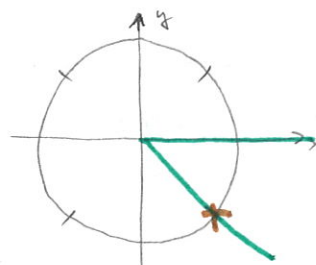
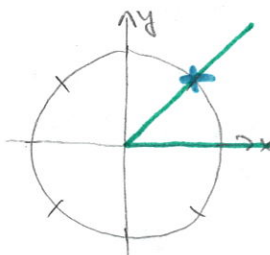
a) $\frac{22}{3}\pi$; $-\frac{2}{3}\pi$

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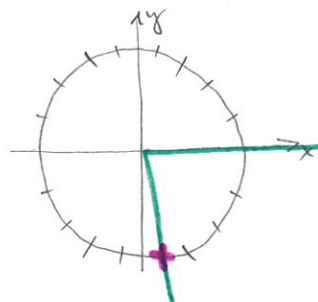
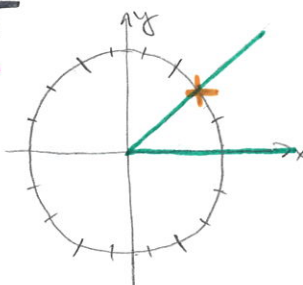
b) $\frac{17}{4}\pi$; $-\frac{9}{4}\pi$

ne



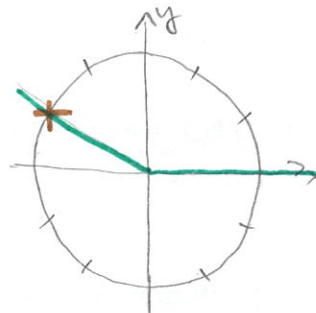
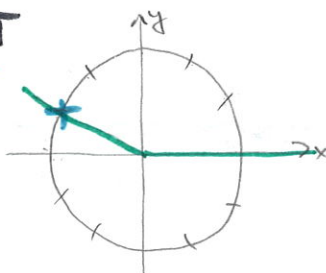
c) $\frac{38}{9}\pi$; $-\frac{4}{9}\pi$

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d) $\frac{41}{6}\pi$; $-\frac{19}{6}\pi$

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Pr5

Zapište ve tvaru $x = x_0 + k \cdot 2\pi$, kde $x_0 \in \langle 0; 2\pi \rangle$:

a) $\frac{17}{3}\pi$

$$\frac{17}{3}\pi \sim \frac{17}{3}\pi - \frac{6}{3}\pi = \frac{11}{3}\pi \sim \frac{11}{3}\pi - \frac{6}{3}\pi = \frac{5}{3}\pi$$

$$\boxed{\frac{17}{3}\pi = \frac{5}{3}\pi + 2 \cdot 2\pi}$$

b) $\frac{11}{4}\pi$

$$\frac{11}{4}\pi \sim \frac{11}{4}\pi - \frac{8}{4}\pi = \frac{3}{4}\pi$$

$$\boxed{\frac{11}{4}\pi = \frac{3}{4}\pi + 2\pi}$$

c) $\frac{28}{5}\pi$

$$\frac{28}{5}\pi \sim \frac{28}{5}\pi - \frac{10}{5}\pi = \frac{18}{5}\pi \sim \frac{18}{5}\pi - \frac{10}{5}\pi = \frac{8}{5}\pi$$

$$\boxed{\frac{28}{5}\pi = \frac{8}{5}\pi + 2 \cdot 2\pi}$$

$$d) \frac{47}{9}\pi$$

$$\frac{47}{9}\pi \sim \frac{47}{9}\pi - \frac{18}{9}\pi = \frac{29}{9}\pi \sim \frac{29}{9}\pi - \frac{18}{9}\pi = \underline{\underline{\frac{11}{9}\pi}}$$

$$\boxed{\frac{47}{9}\pi = \frac{11}{9}\pi + 2 \cdot 2\pi}$$

$$e) -\frac{16}{6}\pi$$

$$-\frac{16}{6}\pi \sim -\frac{16}{6}\pi + \frac{12}{6}\pi = -\frac{4}{6}\pi \sim -\frac{4}{6}\pi + \frac{12}{6}\pi = \underline{\underline{\frac{8}{6}\pi}}$$

$$\boxed{-\frac{16}{6}\pi = \frac{8}{6}\pi - 2 \cdot 2\pi}$$

$$f) -\frac{21}{5}\pi$$

$$\begin{aligned} -\frac{21}{5}\pi &\sim -\frac{21}{5}\pi + \frac{10}{5}\pi = -\frac{11}{5}\pi \sim -\frac{11}{5}\pi + \frac{10}{5}\pi = -\frac{1}{5}\pi \sim \\ &\sim -\frac{1}{5}\pi + \frac{10}{5}\pi = \underline{\underline{\frac{9}{5}\pi}} \end{aligned}$$

$$\boxed{-\frac{21}{5}\pi = \frac{9}{5}\pi - 3 \cdot 2\pi}$$