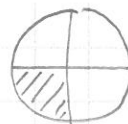


$$4.4 \quad \sin \alpha = -\frac{2}{11}, \quad \pi \leq \alpha \leq \frac{3\pi}{2}$$



III - mely. $\cos \alpha < 0$

Permutáció: $\sin^2 \alpha + \cos^2 \alpha = 1$

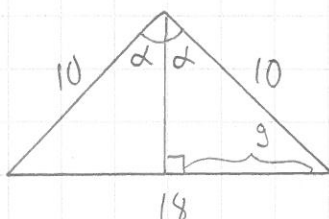
$$\Rightarrow \left(-\frac{2}{11}\right)^2 + \cos^2 \alpha = 1 \quad (\Rightarrow) \quad \frac{4}{121} + \cos^2 \alpha = 1 \quad (\Rightarrow) \quad \cos^2 \alpha = 1 - \frac{4}{121} = \frac{117}{121} \quad \sqrt{}$$

$$(\Rightarrow) \quad \cos \alpha = (\pm) \sqrt{\frac{117}{121}} = -\frac{\sqrt{117}}{11}$$

$$\Rightarrow \sin 2\alpha = 2 \sin \alpha \cos \alpha = 2 \cdot \left(-\frac{2}{11}\right) \cdot \left(-\frac{\sqrt{117}}{11}\right) = \frac{4\sqrt{117}}{121}$$

$$4.6 \quad \begin{aligned} & (\sin \alpha + \cos \alpha)^2 + (\sin \alpha - \cos \alpha)^2 \\ &= (\sin^2 \alpha + 2 \sin \alpha \cos \alpha + \cos^2 \alpha) + (\sin^2 \alpha - 2 \sin \alpha \cos \alpha + \cos^2 \alpha) \\ &= 2 \sin^2 \alpha + 2 \cos^2 \alpha \\ &= 2 (\underbrace{\sin^2 \alpha + \cos^2 \alpha}_{=1}) = 2 \cdot 1 = 2 \end{aligned} \quad \left| \begin{aligned} & (a+b)^2 + (a-b)^2 \\ &= (a^2 + 2ab + b^2) + (a^2 - 2ab + b^2) \end{aligned} \right.$$

4.7



$$\cos 2\alpha = 1 - 2 \sin^2 \alpha$$

$$= 1 - 2 \cdot \left(\frac{9}{10}\right)^2 = 1 - 2 \cdot \frac{81}{100} = 1 - \frac{81}{50}$$

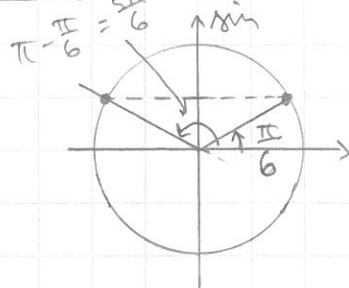
$$= -\frac{31}{50}$$

4.15

5. Szimplifikáció

Exm. 1 Rátérítse egyenlet $\sin x = \frac{1}{2}$

Ratk. $\sin x = \frac{1}{2} \Rightarrow x = 30^\circ \left(\frac{\pi}{6} \text{ rad}\right)$



Kétféle megoldás

$$\left. \begin{aligned} & \frac{\pi}{6} + 2\pi \\ & \text{vagy} \quad \frac{\pi}{6} + 2 \cdot 2\pi \\ & \text{vagy} \quad \frac{\pi}{6} + 3 \cdot 2\pi \\ & \vdots \\ & \text{vagy} \quad \frac{\pi}{6} - 2\pi \\ & \text{vagy} \quad \frac{\pi}{6} - 2 \cdot 2\pi \\ & \vdots \end{aligned} \right\}$$

$$\frac{\pi}{6} + m \cdot 2\pi, m \in \mathbb{Z} = \{0, \pm 1, \pm 2, \dots\}$$

Vagyis minden megoldás $x = \frac{6\pi}{6} - \frac{\pi}{6} = \frac{6\pi - \pi}{6} = \frac{5\pi}{6} \Rightarrow \frac{5\pi}{6} + m \cdot 2\pi$

Vég. $x = \frac{\pi}{6} + m \cdot 2\pi$ vagy $x = \frac{5\pi}{6} + m \cdot 2\pi, m \in \mathbb{Z}$