

$$\frac{1}{|\cos \alpha|} - \frac{\sin \alpha}{\cos \alpha} = \frac{1 - \sin \alpha}{|\cos \alpha|}$$

if $\cos \alpha > 0 \rightarrow \frac{1 - \sin \alpha}{\cos \alpha} = \frac{1 - \sin \alpha}{\cos \alpha} \checkmark \bar{0} \bar{0}$

if $\cos \alpha < 0 \rightarrow \frac{-1 - \sin \alpha}{\cos \alpha} = \frac{\sin \alpha - 1}{\cos \alpha} \times \bar{0} \bar{0}$

$\Rightarrow \cos \alpha > 0$ ①

$$\cot \alpha = \frac{\cos \alpha}{\sin \alpha} \xrightarrow{\text{مخرج را ضرب کنیم}} \frac{\cos \alpha}{\sin \alpha} > 0$$

①, ② $\rightarrow \alpha$

مسئله اول جواب مطلوبه

$$-\frac{\pi}{2} < \alpha < \frac{\pi}{2} \Rightarrow -\frac{\pi}{2} < m < \frac{\pi}{2} \Rightarrow 0 \leq \sin m \leq 1$$

$$0 \leq \frac{m-1}{\varepsilon} \leq 1 \Rightarrow 0 \leq m-1 \leq \varepsilon \Rightarrow \boxed{1 \leq m \leq 1 + \varepsilon}$$

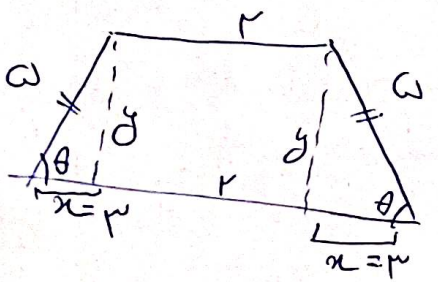
* جواب اول

$$\tan \alpha + \cot \alpha = -\frac{1}{\mu} \Rightarrow \frac{1}{\sin \alpha \cos \alpha} = -\frac{1}{\mu} \Rightarrow -\frac{1}{\mu} = \sin \alpha \cos \alpha$$

$$(\sin \alpha + \cos \alpha)^2 = \sin^2 \alpha + \cos^2 \alpha + 2 \sin \alpha \cos \alpha = 1 + 2 \times \left(-\frac{1}{\mu}\right)$$

$$\Rightarrow \sqrt{1 - \frac{2}{\mu}} = \sin \alpha + \cos \alpha \quad \frac{\sqrt{\mu}}{\varepsilon} < \alpha < \frac{\pi}{2} \Rightarrow \boxed{\frac{\sqrt{\mu}}{\varepsilon} = \sin \alpha + \cos \alpha}$$

$$\frac{1}{\sin^2 \alpha + \cos^2 \alpha} = \frac{1}{(\sin \alpha + \cos \alpha)(\sin \alpha + \cos \alpha - \sin \alpha \cos \alpha)} = \frac{1}{-\frac{\sqrt{\mu}}{\varepsilon} \times \left(1 - \frac{1}{\mu}\right)} = \boxed{\frac{9}{\varepsilon \sqrt{\mu}}}$$



$$\cos \theta = \frac{4}{10} = \frac{x}{a} \Rightarrow \boxed{x = 4}$$

$$\Rightarrow x^2 + y^2 = a^2 \Rightarrow \boxed{y = 8}$$

از قضیه فیثاغورس

مسئله دوم $= \frac{(2+1) \times 8}{2} = \boxed{10}$ * جواب

2

3

4

$$\tan\left(\frac{3\pi}{4} + \omega\right) \times (-\tan(\pi - \omega)) - \sin(4\pi + \omega) \cos\left(\frac{3\pi}{4} - \omega\right) =$$

$$-\cot \omega \times (\tan \omega) - \sin \omega (-\sin \omega) = -1 + \sin^2 \omega = -(1 - \sin^2 \omega) =$$

$$-\cos^2 \omega \rightarrow \boxed{K = -1} \text{ -1}^* \star$$

$$\cos(1) = \cos(\pi + \pi) = -\cos \pi = -\frac{\sqrt{3}}{2}$$

$$\text{Q.3} \sin(13\omega) = \sin(\pi - 2\omega) = \sin(2\omega) = \frac{\sqrt{3}}{2}$$

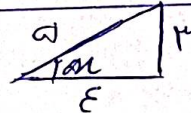
$$\left. \begin{aligned} &\sqrt{2} \times \left(-\frac{\sqrt{3}}{2}\right) \sin 2\omega - \sqrt{2} \times \left(\frac{\sqrt{3}}{2}\right) \cos 2\omega = \\ &-\frac{1}{2} \sin(2\omega) - \frac{1}{2} \cos 2\omega = \\ &-\frac{1}{2} (\sin 2\omega + \cos 2\omega) = -\frac{1}{2} (\sin(\frac{3\pi}{4} - \pi) + \cos(\pi - \pi)) = \boxed{\cos \pi} \end{aligned} \right\}$$

سین عبارت = 1

$$14 \cos^2\left(\frac{\pi}{14}\right) \cos^2\left(\frac{\pi}{4}\right) \cos^2\left(\frac{\pi}{7}\right) \cos^2\left(\frac{3\pi}{7}\right) = 14 \left(\frac{1 + \cos \frac{\pi}{7}}{2}\right) \left(\frac{1}{2}\right) \left(\frac{1}{2}\right) \left(\frac{1}{2}\right) =$$

$$14 \left(\frac{1}{14}\right) \left(\frac{1}{2}\right) \left(\frac{1 + \sqrt{3}}{2}\right) = \boxed{\frac{1 + \sqrt{3}}{2}}$$

* جواب *

$$\epsilon + \epsilon \sin \alpha = 1 - \sin \alpha \Rightarrow \sin \alpha = -\frac{\epsilon}{\omega}$$


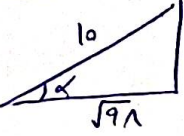
$$\Rightarrow \tan \alpha = \frac{\epsilon}{\omega}$$

$$\tan \alpha = \frac{\mu \tan \frac{\alpha}{2}}{1 - \tan^2 \frac{\alpha}{2}} = \frac{\mu}{\epsilon} \Rightarrow \mu - \mu \tan^2 \frac{\alpha}{2} = \epsilon \tan \frac{\alpha}{2} \xrightarrow{\tan \frac{\alpha}{2} = t} \mu t^2 + \epsilon t - \mu = 0$$

$$\rightarrow \Delta = 100 \Rightarrow \begin{cases} t_1 = \frac{1}{\mu} \\ t_2 = \boxed{-\frac{\epsilon}{\mu} = \tan \frac{\alpha}{2}} \end{cases} \checkmark \text{ expression}$$

$$\frac{\sin^2 \theta + (1 + \cos \theta)(1 - \cos \theta)}{\sin \theta (1 - \cos \theta)} = \frac{\sin^2 \theta + 1 - \cos^2 \theta}{\sin \theta (1 - \cos \theta)} = \frac{2 \sin^2 \theta}{\sin \theta (1 - \cos \theta)} = 2 \times \frac{\sin \theta}{1 - \cos \theta} =$$

$$2 \times \frac{1}{\tan \frac{\theta}{2}} = 2 \cot \frac{\theta}{2} \Rightarrow \boxed{K = 2}$$



$$\Rightarrow \cos \alpha = -\frac{\sqrt{11}}{10} \quad , \quad \sin\left(\frac{11\pi}{2}\right) = \sin\left(\frac{3\pi}{2} - \frac{\pi}{2}\right) = \boxed{\frac{\sin \frac{\pi}{2}}{2}} \cos \frac{11\pi}{2} = \boxed{-\frac{\cos \frac{\pi}{2}}{2}}$$

$$\cos\left(\frac{11\pi}{2} + \alpha\right) = \cos \frac{11\pi}{2} \cos \alpha - \sin \frac{11\pi}{2} \sin \alpha = -\frac{\sqrt{2}}{2} \times \left(-\frac{\sqrt{11}}{10}\right) - \frac{\sqrt{2}}{2} \times \left(\frac{\sqrt{2}}{10}\right) =$$

$$\frac{\sqrt{194}}{20} - \frac{2}{20} = \frac{192}{20} = \boxed{\frac{48}{5}}$$