

سوال مشخصات

$$-1 + \frac{-\sqrt{2}}{2} \times \frac{-\sqrt{2}}{2} = -1 + \frac{1}{2} = \frac{-1}{2} \checkmark$$

$$\Rightarrow \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{2} + \frac{-1}{2} = 0 \checkmark$$

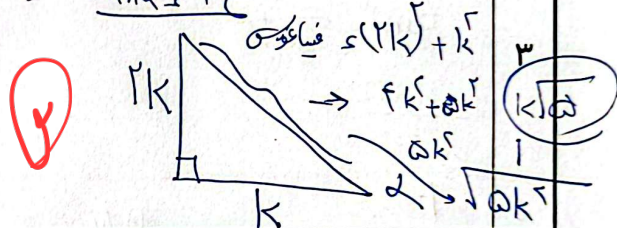
$\cot x = 2$ $\frac{\cos x}{\sin x} = 2$ $2 \sin x = \cos x$

جایگزین

$$\frac{2(2 \sin x) - \sin x}{2 \sin x + \sin x} = \frac{12 \sin x - \sin x}{2 \sin x} = \frac{11 \sin x}{2 \sin x} = \frac{11}{2} \checkmark$$

$\cos x \neq 0 \rightarrow \sin x \neq 0 \rightarrow \frac{1}{\tan x} = \frac{1}{2} \rightarrow \tan x = 2$ $\sin$ و $\cos$ -

$$\cos x = \frac{1}{\sqrt{5}} \rightarrow \frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5} \checkmark$$



5

$$\begin{cases} 2 \sin^2 x + \cos^2 x = \frac{4}{3} \\ \sin^2 x + \cos^2 x = 1 \quad (I) \end{cases} \rightarrow \sin^2 x = 1 - \cos^2 x$$

$$2(1 - \cos^2 x) + \cos^2 x = \frac{4}{3} \rightarrow 2 - 2\cos^2 x + \cos^2 x = \frac{4}{3} \rightarrow 2 - \cos^2 x = \frac{4}{3}$$

$$\cos^2 x = \frac{2}{3} - \frac{4}{3} \rightarrow \cos^2 x = \frac{2}{3} \quad I \rightarrow \sin^2 x + \frac{2}{3} = 1$$

$$\sin^2 x = \frac{1}{3} \quad \tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{3}}{\frac{2}{3}} \rightarrow \frac{1}{2} \times \frac{3}{2} = \frac{1}{2} \quad \tan x = \frac{1}{2} \checkmark$$

$$S_{ABC} = \frac{1}{2} \times \sqrt{3} \times 4 \times \sin \alpha \quad f, \omega \rightarrow 3\sqrt{3} \sin \alpha \quad f, \omega \rightarrow \sin \alpha = \frac{4}{3\sqrt{3}}$$

$$= \frac{4}{3\sqrt{3}} = \frac{4\sqrt{3}}{9} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3} \rightarrow \text{Arc sin } \frac{\sqrt{3}}{3} \rightarrow 12^\circ \quad 6$$

$$\Rightarrow \frac{\max}{\min} = \frac{120}{60} = 2 \quad \text{بابت 2} \quad \checkmark$$

طول 2F
طول 3F
طول 2F
طول 3F

$$2F \times 3F \times \sin 120^\circ = 4F^2 \Rightarrow 4F^2 = 10A$$

$$10A = 10 \times \sqrt{9 \times 2} = 30\sqrt{2} \quad \checkmark$$

$$2F = 5\sqrt{2} \quad \checkmark$$

$$F = \frac{5\sqrt{2}}{2}$$

$$2F = 5\sqrt{2} \quad 2\sqrt{12}$$

$$3\sqrt{12} \quad 2(a+b) = 2(\frac{5\sqrt{2}}{2} + \frac{5\sqrt{2}}{2}) = 5\sqrt{2}$$

(طول من کمره)

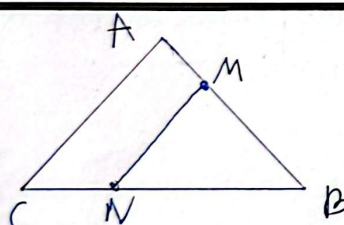
$$\frac{1}{2} \times \omega \times \sqrt{3} \times \sin A = \frac{1}{2} \times \omega \times \sqrt{3} \times \sin A \quad 1, \omega$$

$$S_{ABC} \quad S_{EDA} \Rightarrow f, \omega (\sin A) (\omega - f) = 1, \omega$$

$$\Rightarrow \tan 30^\circ = \frac{f}{\omega} \quad \checkmark$$

$$\frac{\sin 30^\circ}{\cos 30^\circ} = \frac{f}{\omega} \Rightarrow \sin A = \frac{1}{2}$$

$$A = 30^\circ \quad \checkmark$$



BN = \frac{2}{3} NC

BC = \frac{5}{3} NC

AM + MB = \frac{2}{3} AB = 3 \Rightarrow \frac{2}{3} AB = 9 MB

AB = 9 MB

MB = \frac{AB}{9}

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

$$\Rightarrow -\sin \alpha \cos \alpha = \sin \alpha |\cos \alpha| \Rightarrow -\cos \alpha = |\cos \alpha|$$

(نصفی گیریم در صورتی است (خفت نایه اول و دوم)

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

نصفی گیریم که صورتی است (خفت نایه اول و دوم)

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نایه

$$\sin, \cos < 0$$

الف) ربع دوم $\begin{cases} \sin \alpha > 0 \\ \cos \alpha < 0 \end{cases} \rightarrow \cos^2 \alpha = 1 - \sin^2 \alpha \rightarrow \cos^2 \alpha = 1 - \left(\frac{\sqrt{2}}{10}\right)^2 = \frac{98}{100}$ (سالب)

$$\sqrt{} \rightarrow \cos \alpha = \pm \frac{\sqrt{98}}{10} \xrightarrow{\cos \alpha < 0} -\frac{\sqrt{98}}{10} = -\frac{7\sqrt{2}}{10}$$

$$\cos\left(\frac{11\pi}{4} + \alpha\right) \rightarrow \cos\left(\pi - \frac{\pi}{4} + \alpha\right) = \cos\left(\pi + \left(\alpha - \frac{\pi}{4}\right)\right) = -\cos\left(\alpha - \frac{\pi}{4}\right)$$

$$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$$

$$\begin{aligned} -\cos\left(\alpha - \frac{\pi}{4}\right) &= -\left(\cos \alpha \cos \frac{\pi}{4} + \sin \alpha \sin \frac{\pi}{4}\right) = -\left(\frac{\sqrt{2}}{2} \cos \alpha + \frac{\sqrt{2}}{2} \sin \alpha\right) = \\ -\frac{\sqrt{2}}{2} \left(-\frac{7\sqrt{2}}{10} + \frac{\sqrt{2}}{10}\right) &= -\frac{\sqrt{2}}{2} \times \frac{-6\sqrt{2}}{10} = \frac{6}{10} = \frac{3}{5} \end{aligned}$$

ب) $1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \rightarrow 1 + \frac{1}{64} = \frac{1}{\cos^2 \alpha} \rightarrow \cos^2 \alpha = \frac{64}{65} \xrightarrow{\cos \alpha > 0} \cos \alpha = \frac{8\sqrt{2}}{10}$

$$\sin^2 \alpha = 1 - \cos^2 \alpha \rightarrow \sin^2 \alpha = 1 - \frac{64}{65} = \frac{1}{65} \rightarrow \sin^2 \alpha = \frac{1}{65} \xrightarrow{\sin \alpha > 0} \sin \alpha = \frac{\sqrt{65}}{10}$$

$$\sin\left(\frac{11\pi}{4} + \alpha\right) = \sin\left(\pi + \frac{\pi}{4} + \alpha\right) = \sin\left(\pi + \left(\frac{\pi}{4} + \alpha\right)\right) = -\sin\left(\frac{\pi}{4} + \alpha\right)$$

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

$$\begin{aligned} -\sin\left(\frac{\pi}{4} + \alpha\right) &= -\left(\sin \frac{\pi}{4} \cos \alpha + \cos \frac{\pi}{4} \sin \alpha\right) = -\frac{\sqrt{2}}{2} (\cos \alpha + \sin \alpha) = \\ -\frac{\sqrt{2}}{2} \left(\frac{8\sqrt{2}}{10} + \frac{\sqrt{65}}{10}\right) &= -\frac{1}{10} = -\frac{1}{10} \end{aligned}$$