

کتاب دینی / روزنامه دین

به پیوسته

تاریخ 17:

$$\cos^2 \alpha = 1 - \sin^2 \alpha \rightarrow \cos^2 \alpha - \sin^2 \alpha = 1 - \sin^2 \alpha - 1 \quad (1)$$

$$\rightarrow 1 - \sin^2 \alpha = 1 - \sin^2 \alpha \rightarrow \sin^2 \alpha + \sin^2 \alpha - 1 = 0$$

$$\rightarrow (\sin \alpha + 1)(\sin \alpha - 1) = 0 \rightarrow \sin \alpha = -1$$

$$\rightarrow \sin \alpha = -1$$

$$\sin \alpha = -1 \rightarrow \begin{cases} \alpha = 2k\pi + \frac{3\pi}{2} \\ \alpha = 2k\pi + \frac{3\pi}{2} \end{cases} \Rightarrow \begin{cases} \alpha = 2k\pi + \frac{3\pi}{2} \\ \alpha = 2k\pi + \frac{3\pi}{2} \end{cases}$$

Genobar

$$1) \cos^2 \alpha + \cos \alpha - 1 = 0 \rightarrow \cos^2 \alpha - \sin^2 \alpha + \cos \alpha - 1 = 0$$

$$2) \cos^2 \alpha + \cos \alpha - 1 = 0 \rightarrow (\cos \alpha + 1)(\cos \alpha - 1) = 0$$

$$3) \cos \alpha = 1$$

$$4) \cos \alpha = -1 \quad \text{و جابجایی} \Rightarrow \cos \alpha = 1 \rightarrow \alpha = 2k\pi \pm 2\pi \quad \text{و جابجایی}$$

$$5) \sin^2 \alpha - \cos^2 \alpha = (\sin^2 \alpha - \cos^2 \alpha)(\sin^2 \alpha + \cos^2 \alpha) = -\cos^2 \alpha \quad \text{و جابجایی}$$

$$6) \sin^2 \alpha = \cos^2 \alpha$$

$$7) -\cos^2 \alpha = \sin^2 \alpha \cos^2 \alpha \rightarrow -1 = \sin^2 \alpha$$

$$8) \sin \alpha = \sqrt{1 - \cos^2 \alpha} \Rightarrow \alpha = \arccos \left( \frac{1}{2} \right) \Rightarrow \alpha = \frac{\pi}{3}$$

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$$10) \sin \alpha \cos \alpha = 1 - \cos^2 \alpha \rightarrow \sin \alpha = -\cos^2 \alpha$$

$$11) \tan \alpha = -1 \rightarrow \alpha = \frac{3\pi}{4} \quad \text{و جابجایی}$$

$$12) \frac{\cos^2 \alpha + \cos \alpha}{\sin \alpha} = \frac{1}{\sin \alpha} \quad \sin \alpha \neq 0, \cos \alpha \neq 0 \rightarrow \cos^2 \alpha + \cos \alpha = 1 \quad \text{و جابجایی}$$

$$13) \cos^2 \alpha + \cos \alpha - 1 = 0 \rightarrow (\cos \alpha + 1)(\cos \alpha - 1) = 0 \rightarrow \cos \alpha = 1 \text{ or } \cos \alpha = -1$$

$$14) \cos \alpha = \frac{1}{2} \rightarrow \alpha = \arccos \left( \frac{1}{2} \right) \Rightarrow \alpha = \frac{\pi}{3}$$

$$15) \cos \alpha = -1 \rightarrow \alpha = \pi \quad \text{و جابجایی}$$



$$\rightarrow) \tau \sin^2 \alpha - \sin \alpha \cos \alpha + \cos^2 \alpha - \tau = 0$$

$$-\tau \cos^2 \alpha + \cos^2 \alpha = \sin \alpha \cos \alpha \rightarrow -\cos^2 \alpha = \sin \alpha \cos \alpha$$

$$\rightarrow -\cos \alpha = \sin \alpha \rightarrow \tan \alpha = -1 \rightarrow \alpha = \frac{KH + \frac{H}{2}}{2} \rightarrow 11$$

$$w) \cos\left(\frac{H}{2} + \alpha\right) \times \cos\left(\alpha - \frac{H}{2}\right) = \frac{1}{2} \rightarrow \cos\left(\frac{H}{2} + \alpha\right) \times \cos\left(\frac{H}{2} - \alpha\right) = \frac{1}{2}$$

$$\Rightarrow \cos\left(\frac{H}{2} + \alpha\right) \times \sin\left(\frac{H}{2} + \alpha\right) = \frac{1}{2} \rightarrow \frac{1}{2} \sin\left(\frac{H}{2} + \alpha\right) = \frac{1}{2}$$

$$\rightarrow \sin\left(\frac{H}{2} + \alpha\right) = 1 \rightarrow \cos(\alpha) = \frac{1}{2}$$

$$\rightarrow \alpha = \frac{KH + \frac{H}{2}}{2} \rightarrow \alpha = \frac{KH + \frac{H}{2}}{2} \rightarrow 12$$

$$\alpha = \frac{KH + \frac{H}{2}}{2} \rightarrow \alpha = \frac{KH + \frac{H}{2}}{2} \rightarrow 13$$

$$\rightarrow) \cos\left(\frac{H}{2} - \alpha\right) = \cos\left(\frac{H}{2} + \alpha\right) \rightarrow \cos\left(\frac{H}{2} - \alpha\right) - \cos\left(\frac{H}{2} + \alpha\right) = 0$$

$$\rightarrow -\tau \sin\left(\frac{H}{2} - \alpha\right) \cdot \sin\left(\frac{H}{2} + \alpha\right) = 0 \rightarrow \sin\left(\frac{H}{2} - \alpha\right) = 0 \text{ or } \sin\left(\frac{H}{2} + \alpha\right) = 0$$

$$\rightarrow \sin\left(\frac{H}{2} - \alpha\right) = 0$$

$$\sin\left(\frac{H}{2} - \alpha\right) = 0 \rightarrow \frac{H}{2} - \alpha = KH \rightarrow \alpha = \frac{H}{2} - KH$$

$$\rightarrow \alpha = \frac{H}{2} - KH \rightarrow 14$$

$$\frac{\sin^2 \alpha \cos^2 \alpha + \sin^2 \alpha}{\sin^2 \alpha} = \cos^2 \alpha + \sin^2 \alpha = 1 \quad \sin^2 \alpha \neq 0$$

$$\rightarrow \cos^2 \alpha + 1 = 1 \rightarrow \cos^2 \alpha = 0 \rightarrow \alpha = \frac{KH + \frac{H}{2}}{2}$$

$$\rightarrow \alpha = \frac{KH + \frac{H}{2}}{2} \rightarrow 15$$

$$\frac{\sin \frac{\alpha}{r}}{1 + \cos \frac{\alpha}{r}} = \frac{1 + \cos \frac{\alpha}{r}}{\sin \frac{\alpha}{r}} \rightarrow \sin^2 \frac{\alpha}{r} = 1 + \cos^2 \frac{\alpha}{r} + 2 \cos \frac{\alpha}{r} \quad (5)$$

$$\rightarrow 1 - \cos^2 \frac{\alpha}{r} = 1 + \cos^2 \frac{\alpha}{r} + 2 \cos \frac{\alpha}{r} \rightarrow 2 \cos^2 \frac{\alpha}{r} + 2 \cos \frac{\alpha}{r} = 0$$

$$\rightarrow 2 \cos \frac{\alpha}{r} (\cos \frac{\alpha}{r} + 1) = 0 \rightarrow \cos \frac{\alpha}{r} = -1$$

$$\rightarrow \cos \frac{\alpha}{r} = 0$$

$$\begin{cases} \frac{\alpha}{r} = rKM + \mu \rightarrow \alpha = rKM + r\mu \rightarrow \text{عق قاصون} \end{cases}$$

$$\begin{cases} \frac{\alpha}{r} = KM + \frac{\mu}{r} \rightarrow \alpha = rKM + \mu \rightarrow -\mu \text{ و } \mu \end{cases}$$

$$\rightarrow |\mu - (-\mu)| = 2\mu \rightarrow 2\mu$$

$$\cos^2 \alpha - \sin^2 \alpha \cos^2 \alpha - 1 = 0 \rightarrow -\sin^2 \alpha - \sin^2 \alpha \cos^2 \alpha = 0 \quad (6)$$

$$\rightarrow (\sin^2 \alpha)(1 + \cos^2 \alpha) = 0 \rightarrow \sin \alpha = 0$$

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

$$\begin{cases} \sin \alpha = 0 \rightarrow \alpha = KM \rightarrow [0, \alpha, \mu] \end{cases}$$

$$\begin{cases} \cos^2 \alpha = -1 \rightarrow r\alpha = rKM + \mu \rightarrow \alpha = rKM + \frac{\mu}{r} \end{cases}$$

$$K = r \rightarrow \mu = \frac{\partial \pi}{r} \rightarrow \left[ \frac{\alpha}{r}, \mu, r\mu \right], \frac{\partial \pi}{r}$$

$$\rightarrow 0, \frac{\alpha}{r}, r\mu, \mu \rightarrow [-1, \alpha] \rightarrow \alpha$$

$$\tan\left(\frac{\mu}{r} - \alpha\right) = \frac{1 + \tan \alpha}{1 - \tan \alpha} = \tan \alpha \quad (7)$$

$$\rightarrow \frac{\mu}{r} - \alpha = \alpha + KM \rightarrow 2\alpha = \frac{\mu}{r} - KM$$

$$\rightarrow \alpha = \frac{\mu}{2r} - \frac{KM}{2} \rightarrow \alpha$$



Genobar

$$\sqrt{1 + \sin 2x} = \sqrt{\sin^2 x + \cos^2 x + 2 \sin x \cos x} = |\sin x + \cos x| \quad (10)$$

$$\sqrt{1 - \cos 2x} = \sqrt{\cos^2 x + \sin^2 x - 2 \sin x \cos x} = \sqrt{(\sin x + \cos x)(\sin x - \cos x)}$$

$$\rightarrow |\sin x + \cos x| = \sqrt{(\sin x + \cos x)(\sin x - \cos x)}$$

$$\rightarrow \pm \frac{1}{\sqrt{2}} = \sin x - \cos x = \sqrt{2} \sin(x - \frac{\pi}{2}) \rightarrow \pm \frac{1}{\sqrt{2}} = \sin(x - \frac{\pi}{2})$$

$$\left\{ \begin{array}{l} x - \frac{\pi}{2} = 2k\pi + \frac{\pi}{4} \rightarrow \frac{5\pi}{4} \\ x - \frac{\pi}{2} = 2k\pi + \frac{3\pi}{4} \rightarrow \frac{7\pi}{4} \\ x - \frac{\pi}{2} = 2k\pi + \frac{5\pi}{4} \rightarrow \frac{9\pi}{4} \\ x - \frac{\pi}{2} = 2k\pi + \frac{7\pi}{4} \rightarrow \frac{11\pi}{4} \end{array} \right\} \quad \text{--- } 1. \text{ } \frac{\pi}{2}$$

$$w) |(\sin^2 x + \cos^2 x)| (\sin^2 x - \cos^2 x) = 1 \rightarrow \sin^2 x - \cos^2 x = 1 \quad (10)$$

$$\rightarrow 2\sin^2 x - 1 = 1 \rightarrow \sin^2 x = 1 \rightarrow \sin x = \pm 1$$

$$x = k\pi + \frac{\pi}{2} \rightarrow \frac{\pi}{2}, \frac{3\pi}{2} \rightarrow 2$$

ب)  $\sin^2 x - \cos^2 x = -1$  این بابی حالت ها را حل می کنیم!

$$\rightarrow 0 - 1 = -1 \checkmark \rightarrow (0, \frac{\pi}{2}, \frac{3\pi}{2})$$

$$\rightarrow 0 - (-1) = 1 \times$$

$$\rightarrow 1 - 0 = 1 \times$$

$$\rightarrow 1 - 0 = 1 \checkmark$$



سوال ۹

$$\sqrt{1 + \sin 2x} = \sqrt{2} \cos x \xrightarrow{\text{توان ۲}} 1 + \sin 2x = 2 \cos^2 x$$

$$1 + \sin 2x = 2 - 2 \sin^2 x \rightarrow 2 \sin^2 x + \sin 2x - 1 = 0 \rightarrow \sin 2x = -1$$

$$\sin 2x = -1 \rightarrow 2x = 2k\pi - \frac{\pi}{2} \xrightarrow[k \in \mathbb{Z}}{0 \leq x \leq \pi} x = \frac{3\pi}{4} \quad \hookrightarrow \sin 2x = +\frac{1}{2}$$

$$\sin 2x = \frac{1}{2} \rightarrow 2x = 2k\pi + \frac{\pi}{6} \text{ یا } 2k\pi + \frac{5\pi}{6} \xrightarrow[k \in \mathbb{Z}}{0 \leq x \leq \pi} x = \frac{\pi}{12} \text{ یا } \frac{5\pi}{12}$$

چون عبارت به توان ۲ رسیده است جواب زائد تولید میکنند  
به ازای  $x = \frac{5\pi}{12}$   $\cos 2x$  منفی میشود چنانچه جواب را بیاید است نادرست

\* معادله ۲ جواب دارد