

کتاب دینی / روزنامه دینی

پیدا

کتاب ۱۷:

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

①

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

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

$$\rightarrow \sin \alpha = \frac{1}{r}$$

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

$$\Rightarrow \begin{cases} \alpha = 2k\pi + \frac{\pi}{r} \\ \alpha = 2k\pi + \pi - \frac{\pi}{r} \end{cases}$$

۲.۲

Genobar



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

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

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

$$4) \cos \alpha = -\frac{r}{r} \text{ قسمة } \Rightarrow \cos \alpha = 1 \rightarrow \alpha = rKM \pm rKM \text{ (rKM) } \leftarrow$$

$$5) \sin^2 \alpha - \cos^2 \alpha = (\sin^2 \alpha - \cos^2 \alpha) (\sin^2 \alpha + \cos^2 \alpha) = -\cos^2 \alpha \quad \textcircled{1}$$

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

$$7) -\cos^2 \alpha = r \sin^2 \alpha \cos^2 \alpha \rightarrow -\frac{1}{r} = \sin^2 \alpha$$

$$8) \begin{cases} r \alpha = rKM + \frac{\Delta M}{r} \Rightarrow \alpha = KM + \frac{\Delta M}{r} \rightarrow ? \\ r \alpha = rKM + M - \frac{\Delta M}{r} \Rightarrow \alpha = KM - \frac{M}{r} \end{cases}$$

$$9) r \sin \alpha \cos \alpha = 1 - r \cos^2 \alpha \rightarrow \sin^2 \alpha = -\cos^2 \alpha$$

$$10) \tan^2 \alpha = -1 \rightarrow \alpha = KM + \frac{rM}{2} \rightarrow \alpha = \frac{KM}{r} + \frac{rM}{2} \rightarrow ?$$

$$11) 1) \frac{r(\cos^2 \alpha + \cos \alpha)}{\sin \alpha} = \frac{1}{\sin \alpha} \quad \begin{matrix} \sin \alpha \neq 0 \\ \cos \alpha \neq 0 \end{matrix} \rightarrow r \cos^2 \alpha + \cos \alpha = 1 \quad \textcircled{2}$$

$$12) r \cos^2 \alpha + \cos \alpha - 1 = 0 \rightarrow (\cos \alpha + 1) (r \cos \alpha - 1) = 0 \rightarrow \begin{cases} \cos \alpha = \frac{1}{r} \\ \cos \alpha = -1 \end{cases}$$

$$13) \begin{cases} \cos \alpha = \frac{1}{r} \rightarrow \alpha = rKM \pm \frac{M}{r} \end{cases}$$

$$14) \cos \alpha = -1 \rightarrow \alpha = rKM + M \rightarrow \text{دائره زياره (تقریباً) } \leftarrow$$



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

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

$$\rightarrow -\cos \alpha = \sin \alpha \rightarrow \tan \alpha = -1 \rightarrow \alpha = \frac{K\pi + \frac{3\pi}{2}}{2} \rightarrow 11$$

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

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

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

$$\rightarrow 2\alpha = 2K\pi + \frac{\pi}{3} \rightarrow \alpha = K\pi + \frac{\pi}{6}$$

$$\rightarrow 2\alpha = 2K\pi - \frac{\pi}{3} \rightarrow \alpha = K\pi - \frac{\pi}{6} \rightarrow 12$$

$$\rightarrow) \cos\left(\frac{\pi}{4} - 2\alpha\right) = \cos\left(\frac{\pi}{4} + 2\alpha\right) \rightarrow \cos\left(\frac{\pi}{4} - 2\alpha\right) - \cos\left(\frac{\pi}{4} + 2\alpha\right) = 0$$

$$\rightarrow -2 \sin\left(\frac{11\pi}{4}\right) \cdot \sin\left(\frac{\sqrt{2}\pi}{4} - 2\alpha\right) = 0 \rightarrow \sin\left(\frac{11\pi}{4}\right) = 0 \text{ or } \sin\left(\frac{\sqrt{2}\pi}{4} - 2\alpha\right) = 0$$

$$\rightarrow \sin\left(\frac{\sqrt{2}\pi}{4} - 2\alpha\right) = 0$$

$$\sin\left(\frac{\sqrt{2}\pi}{4} - 2\alpha\right) = 0 \rightarrow \frac{\sqrt{2}\pi}{4} - 2\alpha = K\pi \rightarrow 2\alpha = \frac{\sqrt{2}\pi}{4} - K\pi$$

$$\rightarrow \alpha = \frac{\sqrt{2}\pi}{8} - \frac{K\pi}{2} \rightarrow 13$$

$$\frac{\sin 2\alpha \cos 2\alpha + \sin 2\alpha}{\sin 2\alpha} = \cos^2 \alpha + \sin^2 \alpha = 1 \quad \sin 2\alpha \neq 0 \rightarrow 14$$

$$\rightarrow \cos 2\alpha + 1 = 1 \rightarrow \cos 2\alpha = 0 \rightarrow 2\alpha = K\pi + \frac{\pi}{2}$$

$$\rightarrow \alpha = \frac{K\pi}{2} + \frac{\pi}{4} \rightarrow 15$$



$$\frac{\sin \frac{x}{r}}{1 + \cos \frac{x}{r}} = \frac{1 + \cos \frac{x}{r}}{\sin \frac{x}{r}} \rightarrow \sin^2 \frac{x}{r} = 1 + \cos^2 \frac{x}{r} + 2 \cos \frac{x}{r} \quad (7)$$

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

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

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

$$\begin{cases} \frac{x}{r} = 2KM + \pi \rightarrow x = 2KM + \pi \rightarrow \text{نقطة خارجة عن دائرة} \end{cases}$$

$$\begin{cases} \frac{x}{r} = KM + \frac{\pi}{r} \rightarrow x = 2KM + \pi \rightarrow -M, M \end{cases}$$

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

$$\cos^2 x - \sin^2 x \cos^2 x - 1 = 0 \rightarrow -\sin^2 x - \sin^2 x \cos^2 x = 0 \quad (8)$$

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

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

$$\begin{cases} \sin x = 0 \rightarrow x = KM \rightarrow [0, \pi, 2\pi] \end{cases}$$

$$\begin{cases} \cos^2 x = -1 \rightarrow x = 2KM + \pi \rightarrow x = 2KM + \pi \end{cases}$$

$$\rightarrow [x, M, 2M]$$

$$\rightarrow 0, \frac{x}{r}, 2M, M \rightarrow [-1, 1] \rightarrow x$$

$$\tan\left(\frac{\pi}{2} - x\right) = \frac{1 + \tan x}{1 - \tan x} = \tan \frac{\pi}{4} \quad (9)$$

$$\rightarrow \frac{\pi}{2} - x = \frac{\pi}{4} + KM \rightarrow 2x = \frac{\pi}{2} - KM$$

$$\rightarrow x = \frac{\pi}{4} - \frac{KM}{2} \rightarrow x$$



Genobar

$$\sqrt{1+\sin 2x} = \sqrt{\sin^2 x + \cos^2 x + 2\sin x \cos x} = |\sin x + \cos x| \quad (9)$$

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

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

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

$$\left\{ \begin{array}{l} x - \frac{\pi}{2} = 2K\pi + \frac{\pi}{4} \rightarrow \frac{5\pi}{4} \\ x - \frac{\pi}{2} = 2K\pi + \frac{3\pi}{4} \rightarrow \frac{7\pi}{4} \\ x - \frac{\pi}{2} = 2K\pi + \frac{5\pi}{4} \rightarrow \frac{9\pi}{4} \\ x - \frac{\pi}{2} = 2K\pi + \frac{7\pi}{4} \rightarrow \frac{11\pi}{4} \end{array} \right\} \quad \begin{array}{l} -1.9\pi \\ \rightarrow 1 \end{array}$$

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

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

$$x = 2K\pi + \frac{\pi}{2} \rightarrow \frac{\pi}{2}, \frac{5\pi}{2} \rightarrow 2$$

$$b) \sin^2 x - \cos^2 x = -1 \rightarrow \text{ایک باب کی حالت میں حل کی گئی!}$$

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

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

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

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