

تمامی کهای نوشته شده در حاشیه (هوانا) $K \in \mathbb{Z}$

الف) $\cos 2x = 3 \sin x - 1 \Rightarrow 0 = 3 \sin^2 x + 3 \sin x - 2$
 $1 - 2 \sin^2 x$

حد و ریشه ها
 جمع ریشه ها
 $\sin x = \frac{-3 \pm \sqrt{9 - 4(3)(-2)}}{2(3)}$
 $\sin x = \frac{-3 \pm 5}{6}$
 چون $\sin x$ در بازه $[-1, 1]$ می تواند باشد

$\sin x = \frac{1}{3} \Rightarrow \sin x = \sin \frac{\pi}{6} \Rightarrow \begin{cases} x = 2K\pi + \frac{\pi}{6} \\ x = 2K\pi + \pi - \frac{\pi}{6} \end{cases}$
 سازه تکراری
 تکرار می شود

ب) $\cos 2x + \cos x - 2 = 0 \Rightarrow 2 \cos^2 x + \cos x - 3 = 0$
 $2 \cos^2 x - 1$
 جمع ضرایب = 0
 $\cos x = \frac{-1 \pm \sqrt{1 - 4(2)(-3)}}{2(2)}$
 $\cos x = \frac{-1 \pm \sqrt{25}}{4}$
 چون $\sin x$ در بازه $[-1, 1]$ می تواند باشد

$\cos x = 1 \Rightarrow \cos x = \cos 0 \Rightarrow x = 2K\pi \pm 0 \Rightarrow x = 2K\pi$

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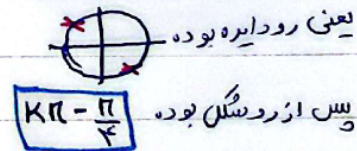
الف) $\sin^2 x - \cos^2 x = \sin x$
 $-(\cos^2 x - \sin^2 x) = \sin x$

$-(\cos^2 x - \sin^2 x)(\cos^2 x + \sin^2 x) = \sin x (\cos^2 x + \sin^2 x)$
 $-\cos^2 x = \sin x$
 if $\cos x \neq 0 \Rightarrow \frac{1}{\cos^2 x} = \sin x \Rightarrow \sin x = \frac{1}{\cos^2 x}$

if $\cos x = 0 \Rightarrow \cos^2 x = 0 \Rightarrow \cos^2 x = \cos 0 \Rightarrow 2x = 2K\pi \pm 0$
 $x = K\pi$

I $\begin{cases} 2x = 2K\pi + \frac{\pi}{2} \\ 2x = 2K\pi + \pi - \frac{\pi}{2} \end{cases} \Rightarrow \begin{cases} x = K\pi + \frac{\pi}{4} \\ x = K\pi + \frac{3\pi}{4} \end{cases}$
 هم برعکس
 ندارند
 پس ۲ دسته
 جواب کلی دارد

ب) $2 \cos^2 x + 2 \sin x \cos x = 1$
 $2 \cos^2 x - 1 + \sin 2x = 0$
 $\cos 2x = -\sin 2x \Rightarrow \tan 2x = -1$



الف) $\cot x (2 \cos x + 1) = \frac{1}{\sin x}$
 $\frac{\cos x}{\sin x} (2 \cos x + 1) = \frac{1}{\sin x}$
 $\cos x (2 \cos x + 1) = 1 \Rightarrow 2 \cos^2 x + \cos x - 1 = 0$
 چون $\sin x \neq 0$
 I $\cos x = \frac{1}{2} \Rightarrow x = 2K\pi + \frac{\pi}{3}$
 II $\cos x = -1 \Rightarrow x = 2K\pi + \pi$
 I $\cos x = \frac{1}{2} \Leftarrow b = a + c$
 II $\cos x = -1$

ب) $2 \sin^2 x - \sin x \cos x + \cos^2 x = 2$
 $\sin^2 x - \sin x \cos x + \cos^2 x = 1$
 $\sin^2 x - \sin x \cos x + \cos^2 x = \sin^2 x + \cos^2 x$
 $-\sin x \cos x = 0$
 if $\cos x \neq 0 \Rightarrow \sin x = 0 \Rightarrow x = 2K\pi$
 if $\cos x = 0 \Rightarrow \sin x = \pm 1 \Rightarrow x = 2K\pi + \frac{\pi}{2}$
 $\tan x = -1$
 $x = K\pi - \frac{\pi}{4}$

$$\cos\left(\frac{\pi}{4} + x\right) \cos\left(x - \frac{\pi}{4}\right) = \frac{1}{4} \Rightarrow \left(\frac{\sqrt{2}}{4} \cos x - \frac{\sqrt{2}}{4} \sin x\right) \left(\frac{\sqrt{2}}{4} \cos x + \frac{\sqrt{2}}{4} \sin x\right) = \frac{1}{4} \quad - ۴$$

$$\cos 2x = \cos \frac{\pi}{4} \quad \Leftrightarrow \frac{\cos^2 x - \sin^2 x}{\cos 2x} = \frac{1}{4} \Leftrightarrow \frac{\sqrt{2}}{4} \times \frac{\sqrt{2}}{4} (\cos x - \sin x)(\cos x + \sin x) = \frac{1}{4} \quad \ll$$

$$\Downarrow$$

$$2x = 2k\pi \pm \frac{\pi}{4} \Rightarrow x = k\pi \pm \frac{\pi}{8}$$

ب) $\cos\left(2x - \frac{\pi}{4}\right) = -\sin 2x$ بلن و راهم جریه دی به بتری هم نام راستش بلن که با و $\cos$ و به $\sin$ تبدیل کن

$$2x - \frac{\pi}{4} + \theta = \frac{\pi}{2} \quad \frac{\pi}{2} \quad \text{وقتی میزایم اینا رو کنیم یعنی باید یکم جمع زاده $\cos$ که داریم با $\sin$ که بدست میاریم باید به $\frac{\pi}{2}$ نشیند}$$

$$\theta = \frac{\pi}{4} + \frac{\pi}{4} - 2x = \frac{11\pi}{14} - 2x \Rightarrow \sin\left(\frac{11\pi}{14} - 2x\right) = -\sin 2x$$

$$2x = 2k\pi - \frac{11\pi}{14} + 2x$$

$$2x = 2k\pi + \pi - \frac{11\pi}{14} - 2x$$

$$4x = 2k\pi + \frac{5\pi}{14} \Rightarrow x = \frac{k\pi}{2} + \frac{5\pi}{28}$$

$$\frac{\sin^2 x + \sin^2 x}{\sin^2 x} - \sin^2 x = \cos^2 x \quad \text{باز کنیم} \Rightarrow \frac{2\sin^2 x + \sin^2 x}{\sin^2 x} = \frac{\cos^2 x + \sin^2 x}{1} \Rightarrow 2\cos^2 x = 0$$

$$\Downarrow \cos^2 x = 0 \Rightarrow \cos^2 x = \cos 0$$

$$x = k\pi \quad \Leftarrow 2x = 2k\pi \quad \ll$$

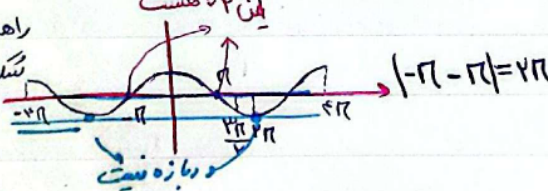
$$\frac{\sin \frac{\pi}{4}}{1 + \cos \frac{\pi}{4}} = \frac{1}{\sin \frac{\pi}{4}} + \frac{\cos \frac{\pi}{4}}{\sin \frac{\pi}{4}} \quad \frac{\cos \frac{\pi}{4} \neq -1}{\sin \frac{\pi}{4} \neq 0} \quad \sin^2 \frac{\pi}{4} = 1 + \cos^2 \frac{\pi}{4} + 2\cos \frac{\pi}{4} \Rightarrow 0 = 1 - \sin^2 \frac{\pi}{4} + \cos^2 \frac{\pi}{4} + 2\cos \frac{\pi}{4} - 1$$

$$I \quad x = 4k\pi \Leftrightarrow \frac{x}{4} = k\pi \quad \Leftarrow \cos 0 = 0 = \cos \frac{\pi}{4} \quad 0 = 2(\cos^2 \frac{\pi}{4} + \cos \frac{\pi}{4}) \quad \ll$$

$$x = 4k\pi + 4\pi \Leftrightarrow x = 4k\pi + 4\pi \quad \Leftarrow \frac{x}{4} = k\pi + \pi \quad \cos \pi = -1 = \cos \frac{\pi}{4} \quad 0 = \cos \frac{\pi}{4} (\cos \frac{\pi}{4} + 1)$$

I و II $\Rightarrow 4k\pi$ راهم جریه به نظر منته

(بیشتر عدد از ۰ و ۰ نشیند)



$$T = \frac{2\pi}{\frac{1}{4}} = 8\pi$$

$$\cos^2 x - \sin^2 x \cos^2 x = 1 \quad -\sin^2 x - \sin^2 x \cos^2 x = 0 \Rightarrow -\sin^2 x (1 + \cos^2 x) = 0 \Rightarrow \sin^2 x = 0 = \sin^2 \frac{\pi}{4} \quad \checkmark$$

$$x = 4k\pi + 0, x = 4k\pi + \pi \Rightarrow x = k\pi$$

$$\cos^2 x + 1 = 0 \Rightarrow \cos^2 x = -1 = \cos \pi \Rightarrow x = 2k\pi + \pi$$

$$x = \frac{4k\pi}{4} + \frac{\pi}{4}$$

$$x = \frac{4k\pi}{4} + \frac{\pi}{4} \quad \text{و بازه نیست}$$

دوازدهم فصل B

تکلیف ۱۶

عسل خبازیان

$$\frac{1 - \tan \alpha}{1 + \tan \alpha} = \tan \psi \alpha$$

با کسر چنانچه بود
برای حذف

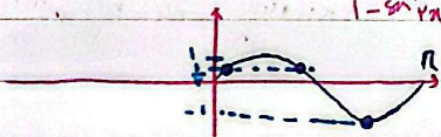
$$\tan(\alpha - \frac{\pi}{4}) = \frac{\sin(\alpha - \frac{\pi}{4})}{\cos(\alpha - \frac{\pi}{4})} = \frac{\frac{\sqrt{2}}{2}(\sin \alpha - \cos \alpha)}{\frac{\sqrt{2}}{2}(\cos \alpha + \sin \alpha)} \cdot \frac{1}{\cos \alpha} = \frac{1 - \tan \alpha}{1 + \tan \alpha}$$

$\alpha = \alpha$

$$\tan(\alpha - \frac{\pi}{4}) = \tan \psi \alpha \rightarrow \psi \alpha = K\pi + \alpha - \frac{\pi}{4}$$

$$\psi \alpha = K\pi - \frac{\pi}{4} \Rightarrow \alpha = \frac{K\pi}{\psi} - \frac{\pi}{4}$$

$$\sqrt{1 + \sin \alpha} = \sqrt{2} \cos \psi \alpha \xrightarrow{\text{توان ۲}} \sqrt{2} \cos^2 \psi \alpha = 1 + \sin \psi \alpha \xrightarrow{\text{مربع}} 2 - 2 \sin^2 \psi \alpha = 1 + \sin \psi \alpha \Rightarrow 2 \sin^2 \psi \alpha + \sin \alpha - 1 = 0$$



$$T = \frac{2\pi}{\psi} = \pi$$

$$\begin{cases} \sin \psi \alpha = \frac{1}{2} \\ \sin \psi \alpha = -1 \end{cases}$$

۳ جواب

$$\sin^2 \alpha - \cos^2 \alpha = 1 \rightarrow (\sin^2 \alpha + \cos^2 \alpha)(\sin^2 \alpha - \cos^2 \alpha) = 1 \rightarrow \cos^2 \alpha = -1 \quad \frac{2\pi}{\psi} = T = \pi$$

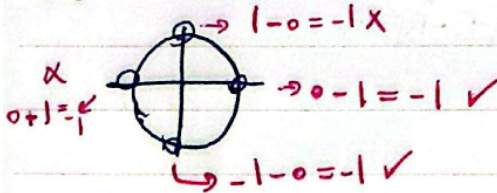


$$\frac{3\pi}{4} \text{ و } \frac{7\pi}{4}$$

شکل بنویس

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

صید بهر جور غده
باید از راه تست نقطه اصلی بروم



$$\frac{\pi}{4} \text{ و } \frac{5\pi}{4}$$