

الف) $1 - 2\sin^2 x = 3\sin x - 1$

$$2\sin^2 x + 3\sin x - 2 = 0$$

$$\sin x = \frac{1}{2} \checkmark \quad \sin x = -2 \text{ غلط}$$

$$x = 2k\pi + \frac{\pi}{6}$$

$$x = 2k\pi + \frac{5\pi}{6}$$

ب) $2\cos^2 x - 1 + \cos x - 2 = 0$

$$2\cos^2 x + \cos x - 3 = 0$$

$$\cos x = \frac{1}{2} \checkmark \quad \cos x = -\frac{3}{2} \text{ غلط}$$

$$x = 2k\pi \pm \frac{\pi}{3}$$

$$x = 2k\pi$$

1,5

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الف) $\sin^2 x - \cos^2 x = \sin^2 x$

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

$$-\cos^2 x = 2\sin^2 x \cdot \cos^2 x$$

$$\sin^2 x = -\frac{1}{2} \quad \text{غلط} \Rightarrow x = \frac{k\pi}{2} + \frac{\pi}{4}$$

$$x = 2k\pi - \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}$$

ب) $2\cos^2 x - 1 = -2\sin x \cdot \cos x$

$$\cos^2 x - \sin^2 x = -2\sin x \cdot \cos x \Rightarrow -\tan^2 x = 1$$

$$\tan^2 x = -1 \quad x = k\pi - \frac{\pi}{4}$$

$$x = \frac{k\pi}{2} - \frac{\pi}{4}$$

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الف) $\frac{\cos x}{\sin x} (2\cos x + 1) = \frac{1}{\sin x}$

$$2\cos^2 x + \cos x = 1$$

$$2\cos^2 x + \cos x - 1 = 0$$

$$\cos x = -1 \checkmark \quad x = (2k+1)\pi$$

$$\cos x = \frac{1}{2} \checkmark \quad x = 2k\pi \pm \frac{\pi}{3}$$

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

$$\frac{\sin^2 x - 1 - \sin x \cdot \cos x}{-\cos^2 x} = 0$$

$$\cos x (\cos x - \sin x) = 0$$

$$\cos x = 0 \quad x = 2k\pi \pm \frac{\pi}{2} \quad \cos x - \sin x = 0$$

$$\cos x = \sin x$$

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

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الف) $\cos(\frac{\pi}{6} + x) \cdot \cos(\frac{\pi}{6} - x) = \frac{1}{4}$

$$\cos(\frac{\pi}{6} + x) \cdot \sin(\frac{\pi}{6} + x) = \frac{1}{4}$$

$$\frac{1}{2} \sin(2x + \frac{\pi}{6}) = \frac{1}{4}$$

$$\cos^2 x = \frac{1}{2} \quad x = 2k\pi \pm \frac{\pi}{4} \quad x = k\pi \pm \frac{\pi}{4}$$

ب) $\cos(x - \frac{\pi}{4}) = \sin(\frac{11\pi}{12} - 2x)$

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

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

$$2x = 2k\pi + 2x - \frac{11\pi}{12} \quad \times$$

$$2x = 2k\pi + \pi - 2x + \frac{11\pi}{12} \quad x = \frac{k\pi}{2} + \frac{19\pi}{24}$$

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

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$$\frac{2\sin^2 x \cdot \cos^2 x + \sin^2 x}{\sin^2 x} = \cos^2 x - \sin^2 x$$

$$2\cos^2 x + 1 = \cos^2 x$$

$$\cos^2 x = -1 \Rightarrow x = (2k+1)\pi \Rightarrow x = \frac{(2k+1)\pi}{2}$$

$$\Rightarrow x = \frac{k\pi}{2} + \frac{\pi}{2}$$

$$\sin^2 x \text{ در } \frac{(2k+1)\pi}{2} \text{ مساوی صفری شود}$$

و متوجه را صفری کند

پس معادله جواب ندارد

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$$\frac{\sin \frac{x}{p}}{1 + \cos \frac{x}{p}} = \frac{1 + \cos \frac{x}{p}}{\sin \frac{x}{p}}$$

$$a = \frac{1}{a}$$

$$a = \pm 1$$

$$\frac{\sin \frac{x}{p}}{1 + \cos \frac{x}{p}} = 1$$

$$1 + \cos \frac{x}{p} = \sin \frac{x}{p}$$



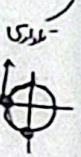
$$\sin \frac{x}{p} - \cos \frac{x}{p} = 1$$

$$\frac{x}{p} = 2k\pi + \frac{\pi}{p} \Rightarrow x = 2k\pi + \pi \quad \frac{x}{p} = \frac{(2k+1)}{p} \pi \Rightarrow x = (2k+1)\pi$$

$$\frac{\sin \frac{x}{p}}{1 + \cos \frac{x}{p}} = -1 \quad \sin \frac{x}{p} + \cos \frac{x}{p} = -1$$

$$\frac{x}{p} = 2k\pi - \frac{\pi}{p} \Rightarrow x = 2k\pi - \pi$$

$$- \pi, \pi : [-\pi, \frac{\pi}{p}] \text{ جواب در بازه } \pi - (-\pi) = 2\pi$$



$$-\sin^2 x \cdot \cos^2 x = \sin^2 x \Rightarrow \sin^2 x = 0 \quad x = k\pi$$

$$\hookrightarrow \cos^2 x = -1 \Rightarrow x = (2k+1)\pi \Rightarrow x = \frac{(2k+1)}{p} \pi$$

جواب: $0, \pi, 2\pi, \frac{\pi}{p}, \frac{2\pi}{p}$

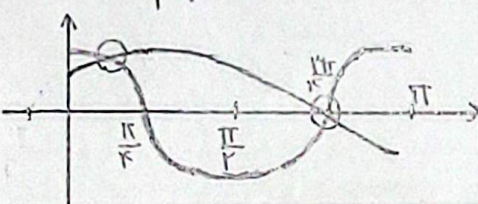
$$\frac{1 - \tan x}{1 + \tan x} = \tan(x - \frac{\pi}{4})$$

$$\tan(x - \frac{\pi}{4}) = \tan^2 x \Rightarrow x = k\pi + x - \frac{\pi}{4} \Rightarrow x = \frac{k\pi}{p} - \frac{\pi}{4}$$

$$\tan(\frac{\pi}{4} - x) = \tan^2 x \rightarrow \frac{\pi}{4} - x = k\pi + x \rightarrow x = \frac{k\pi}{p} + \frac{\pi}{4}$$

$$\sqrt{1 + \sin^2 x} + \sqrt{(\sin^2 x + \cos^2 x)^2} = |\sin x + \cos x| = |\sqrt{2} \sin(x + \frac{\pi}{4})|$$

$$|\sqrt{2} \sin(x + \frac{\pi}{4})| = \sqrt{2} \cos^2 x \Rightarrow |\sin(x + \frac{\pi}{4})| = \cos^2 x$$

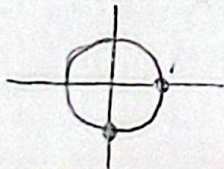


دو جواب

$$-\cos^2 x = 1 \Rightarrow x = (2k+1)\pi \Rightarrow x = \frac{(2k+1)}{p} \pi$$

$$\frac{\pi}{p}, \frac{2\pi}{p}$$

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



$$\Rightarrow 0, 2\pi, \frac{2\pi}{p}$$