

سوال ۱) دقت کن !! (الف)  $\cos 2x = 3 \sin x - 1 = 1 - 2 \sin^2 x$

$$\rightarrow 2 \sin^2 x + 3 \sin x - 2 = 0 \quad \xrightarrow{\sin x = t} \quad 2t^2 + 3t - 2 = 0$$

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$$\xrightarrow{\text{وشت}} \quad 2t^2 + 3t - 2 = (t - \frac{1}{2})(t + 2) = 0 \quad \rightarrow \sin x = -\frac{1}{2} = \sin\left(-\frac{\pi}{6}\right)$$

$$(t + 2)(t - \frac{1}{2}) = 0 \quad \text{ع' ق' ق} \quad \frac{-3}{2} \quad \frac{+1}{2} \quad \rightarrow \sin x = \frac{1}{2} \rightarrow x = 2k\pi + \frac{\pi}{6}$$

$$\rightarrow x = 2k\pi + \frac{7\pi}{6}, \quad x = 2k\pi + \pi - \frac{7\pi}{6} = 2k\pi - \frac{\pi}{6} \quad 2k\pi + \frac{5\pi}{6}$$

ب)  $\cos 2x + \cos x - 2 = 0 = 2 \cos^2 x + \cos x - 2 = 0 \quad \xrightarrow{\cos x = t} \quad 2t^2 + t - 2 = 0$

$$\xrightarrow{\text{وشت}} \quad 2t^2 + t - 2 = (t + 2)(t - 1) = 0 \quad \rightarrow \cos x = 1 \rightarrow x = 2k\pi$$

$$\text{ع' ق' ق} \quad \frac{-1}{2} \quad \frac{2}{1} = 1$$

الف)  $\sin^2 x - \cos^2 x = \sin 2x \rightarrow (\sin^2 x + \cos^2 x)(\sin^2 x - \cos^2 x) = \sin 2x$  سوال ۲

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

$$\rightarrow \cos x = 0 \Rightarrow x = 2k\pi \pm \frac{\pi}{2} \rightarrow x = k\pi \pm \frac{\pi}{2}$$

$$\rightarrow \sin 2x = -\frac{1}{2} = \sin\left(-\frac{\pi}{6}\right) \rightarrow 2x = 2k\pi + \frac{7\pi}{6} \rightarrow x = k\pi + \frac{7\pi}{12}$$

$$\hookrightarrow 2x = 2k\pi + \pi - \frac{7\pi}{6} \rightarrow x = k\pi - \frac{\pi}{12}$$



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

سوال ۲

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

$\cos x = \cos\left(\frac{\pi}{2} + x\right) \rightarrow x = k\pi + \frac{\pi}{2} + x$  جواب — غلط

$x = k\pi - \frac{\pi}{2} - x \rightarrow kx = k\pi - \frac{\pi}{2} \rightarrow x = \frac{k\pi}{2} - \frac{\pi}{2}$

الف)  $\frac{\cos n}{\sin n} (r \cos n + 1) = \frac{1}{\sin n}$   $\text{موجب} \rightarrow \sin n \neq 0$

ب)  $\frac{1}{r}$

$\frac{1}{\sin n} (r \cos n + \cos n - 1) = 0 \rightarrow r \cos n + \cos n - 1 = 0 \rightarrow \frac{1}{r}$

$\cos n = -1 \rightarrow n = 2K\pi + \pi$   $\text{موجب} \rightarrow \sin n = 0$

$\cos n = \frac{1}{r} = \cos\left(\frac{\pi}{r}\right) \rightarrow n = 2K\pi \pm \frac{\pi}{r} \checkmark$



$$\checkmark) \sin^2 n + \sin^2 n + \cos^2 n = 1 + \sin n \cos n$$

مركب

$$\sin^2 n - \sin n \cos n - 1 = 0 \Rightarrow \cos^2 n + \sin n \cos n - \cos n (\sin n + \cos n) = 0$$

$$\cos n = 0 \rightarrow n = \left[ K\pi \pm \frac{\pi}{2} \right] \text{ و } -\sin n = \cos n \rightarrow n = K\pi - \frac{\pi}{2}$$



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ا)  $\cos\left(\frac{\pi}{2} + u\right) \cdot \cos\left(x + \frac{\pi}{2} - \frac{\pi}{4}\right) = \frac{1}{\sqrt{2}}$

سوال ۴

$$\rightarrow \cos\left(\frac{\pi}{2} + u\right) \times \sin\left(u + \frac{\pi}{4}\right) = \frac{1}{\sqrt{2}} \sin\left(u + \frac{\pi}{4}\right) = \frac{1}{\sqrt{2}}$$

$$\sin\left(u + \frac{\pi}{4}\right) = \frac{1}{\sqrt{2}} \rightarrow u + \frac{\pi}{4} = k\pi + \frac{\pi}{4} \rightarrow u = k\pi$$

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$$u + \frac{\pi}{4} = k\pi + \frac{\pi}{4} \rightarrow u = k\pi$$

$$\text{—) } \cos\left(x_m - \frac{\pi}{9}\right) = \sin(-x_m) = \cos\left(\frac{\pi}{r} + x_m\right)$$

سوال

$$\cancel{x_m} - \frac{\pi}{9} = 2K\pi + \frac{\pi}{r} + \cancel{x_m} \text{ جواب صحیح نیست}$$

$$x_m - \frac{\pi}{9} = 2K\pi - \frac{\pi}{r} - x_m \rightarrow x_m = 2K\pi - \frac{\pi}{r} \rightarrow x = \frac{K\pi}{r} - \frac{\pi}{r}$$



$$\frac{\sin \pi n + \sin \pi n}{\sin \pi n} = \cos \pi + \sin \pi = 1$$

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در برخی از حالت های  $\sin \pi n = 0$   $\rightarrow \sin \pi n + \sin \pi n = \sin \pi n \rightarrow \sin \pi n = 0$

مفرجه هم صفر مرستو!  $\rightarrow \pi n = K\pi \rightarrow n = \frac{K\pi}{\pi}$

$$\frac{\sin \frac{x}{2}}{1 + \cos \frac{x}{2}} = \frac{1}{\sin \frac{x}{2}} + \cot \frac{x}{2}$$

سوال 2

$$\rightarrow \tan \frac{x}{2} = \frac{1 + \cos \frac{x}{2}}{\sin \frac{x}{2}} = \frac{1}{\tan \frac{x}{2}} \rightarrow \tan^2 \frac{x}{2} = 1$$

$$\rightarrow \tan \frac{x}{2} = \pm 1 \rightarrow \frac{x}{2} = k\pi + \frac{\pi}{2} \rightarrow x = 2k\pi + \pi$$

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

$$\rightarrow x = -\pi, \pi, 3\pi, \dots$$

مبارزه ذکر شده این دو را با هم  $\rightarrow |\pi - (-\pi)| = 2\pi$

$$\cos^2 x - \sin^2 x \cos \mu x = 1 \rightarrow \underbrace{\cos^2 x - 1}_{-\sin^2 x} - \sin^2 x \cos \mu x = 0$$

سوال 3

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

$$1 + \cos \mu x = 0 \rightarrow \cos \mu x = -1 \rightarrow \mu x = 2k\pi + \pi \rightarrow x = \frac{2}{\mu}k\pi + \frac{\pi}{\mu}$$

$$\rightarrow x = \frac{\pi}{\mu}, \pi, \frac{3\pi}{\mu}, 2\pi, \dots \rightarrow \text{جواب}$$



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

سوال 1

2

$$\frac{\pi}{4} - x = \pi x + k\pi \rightarrow x = \frac{\pi}{12} - \frac{k\pi}{k}$$

$$\sqrt{1 + \sin \pi x} = \sqrt{r} \cos x \rightarrow 1 + \sin \pi x = r \cos^2 x = r - r \sin^2 x$$

سوال 2

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

$$\sin \pi x = -1 \rightarrow \pi x = \pi k - \frac{\pi}{2} \rightarrow x = k - \frac{1}{2} \quad \left( \sin \pi x = \frac{1}{r} \right)$$

$$\frac{0 \leq x \leq \pi}{\rightarrow} x = \frac{\pi}{2}$$

$$\sin \pi x = \frac{1}{r} = \sin\left(\frac{\pi}{4}\right) \rightarrow \pi x = \pi k + \frac{\pi}{4}, \pi x = \pi k + \frac{5\pi}{4}$$

$$x = \frac{\pi}{12} \vee x = \frac{5\pi}{12} \quad \left( 0 \leq x \leq \pi \right) \quad x = k\pi + \frac{\pi}{12}$$

$$x = k\pi + \frac{5\pi}{12}$$

$$\hookrightarrow \text{قوله} \rightarrow x = \frac{5\pi}{12} \rightarrow \text{لا يمكن} \quad \times$$



سوال ۱۰

①

کانونه / انکسیر

د بازه  $[0, 2\pi]$  څخه جواب یوازې

$\frac{3\pi}{2}, \pi, \frac{\pi}{2}$

اند؟

$$\rightarrow \sin^3 x - \cos^3 x = -1$$

$$\frac{\pi}{2} \rightarrow (0, 1) \rightarrow 1 - 0 = -1 \quad \times$$

$$\pi \rightarrow (-1, 0) \rightarrow 0 + 1 = -1 \quad \times$$

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

$$2\pi \rightarrow (1, 0) \rightarrow 0 - 1 = -1 \quad \checkmark$$



$$\frac{2 \sin x_n \cos x_n + \sin x_n}{\sin x_n} = \sin x_n + \cancel{\cos x_n} = 1$$

سوال ۵

$$\frac{\sin x_n (2 \cos x_{n+1})}{\sin x_n} = 1 \xrightarrow{\sin x_n \neq 0} 2 \cos x_{n+1} = 1 \rightarrow \cos x_{n+1} = \frac{1}{2}$$

$$x_n = k\pi + \frac{\pi}{2} \rightarrow \boxed{x = k\pi + \frac{\pi}{2}}$$

در سوالات به فرم  $\pm \sin^n x \pm \cos^n x$  برابر 1 یا -1. فقط گاهی است نگاه اصرار!

سوال ۱۰

$$\sin^4 x - \cos^4 x = 1$$

ج ۱ چک کنی!

$$x = 2\pi \text{ یا } 0$$

$$x = \frac{2\pi}{p}$$



$$\sin^4 x - \cos^4 x = 1$$

الف ۱

$$x = \frac{\pi}{2}$$

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

