

۱۸۱۷۵ رتبه کن!

1

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

۱، ۵

$2 \sin^2 x + 3 \sin x - 2 = 0 \Rightarrow \sin^2 x + 3 \sin x - 2 = 0 \Rightarrow$
 $(\sin x + 4)(\sin x - 1) = 0 \Rightarrow \sin x = \frac{1}{2}$
 $\sin x = \frac{1}{2} \Rightarrow \sin x = \sin \frac{\pi}{6} \Rightarrow x = 2k\pi + \frac{\pi}{6} \quad k \in \mathbb{Z}$
 $\sin x = -\frac{1}{2} \Rightarrow x = 2k\pi + \frac{7\pi}{6}$

یا چقدر!

$\sin x = \frac{1}{2} \Rightarrow \sin x = \sin \frac{\pi}{6} \Rightarrow$

$\sin x = \frac{1}{2} \rightarrow x = 2k\pi + \frac{\pi}{6}$
 $(2k\pi + \frac{5\pi}{6})$

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

$(\cos x + 2)(\cos x - 1) = 0 \Rightarrow \cos x = -2$ (فقط ۱)

$\cos x = 1 \Rightarrow \cos x = \cos 0 \Rightarrow$

$x = 2k\pi$

2

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

یا از جواب ما
 $\cos 2x = 0 \Rightarrow \cos 2x = \cos \frac{\pi}{2} \Rightarrow$

$2x = 2k\pi + \frac{\pi}{2} \Rightarrow x = k\pi + \frac{\pi}{4}$
 $k \in \mathbb{Z}$

$2 \sin^2 x = -1 \Rightarrow \sin^2 x = -\frac{1}{2}$
 $\Rightarrow \sin 2x = \sin \frac{\pi}{2}$

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

$\frac{k\pi}{2} + \frac{\pi}{4}$

جواب



ب) $2 \cos^2 x + 2 \sin x \cos x = 1 \Rightarrow \sin 2x = 1 - \frac{1}{\cos 2x} \Rightarrow \sin 2x = -\cos 2x$

$\div \cos 2x \neq 0 \Rightarrow \tan 2x = -1 \Rightarrow \tan 2x = \tan \frac{3\pi}{4} \Rightarrow 2x = k\pi + \frac{3\pi}{4} \Rightarrow x = \frac{k\pi}{2} + \frac{3\pi}{8}$

تمرین ۱-۲: $\cos x$ و $\sin x$ است و عبارت تعریف نشده مرشد

پس جواب غیر قابل قبول مقبول مرشد

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$$\cot x (2 \cos x + 1) = \frac{1}{\sin x} \Rightarrow \frac{\cos x}{\sin x} (2 \cos x + 1) = \frac{1}{\sin x} \Rightarrow (1, \infty)$$

$$\boxed{2 \cos^2 x + \cos x - 1 = 0} \Rightarrow \cos x = -1 \Rightarrow \cos x = \cos \pi \Rightarrow x = 2k\pi \pm \pi$$

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

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

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

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

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

$$\Rightarrow \tan x = -1 = \tan \frac{3\pi}{4} \Rightarrow$$

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

$$\cos(x - \frac{\pi}{2}) = \cos(-x - \frac{\pi}{2})$$

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

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

$$\Rightarrow \cos 2x = \cos \frac{\pi}{3} \Rightarrow 2x = 2k\pi \pm \frac{\pi}{3} \Rightarrow x = k\pi \pm \frac{\pi}{6}$$

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

$$-\sin 2x = \cos(\frac{\pi}{4} + 2x)$$

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

$$2x = 2k\pi - \frac{9\pi}{4} + \frac{\pi}{4} \Rightarrow$$

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

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

$$\frac{\sin 2x + \sin 4x}{\sin 2x} - \sin 2x = \cos 2x \Rightarrow \frac{2 \sin 2x \cos 2x + \sin 2x}{\sin 2x} = \cos 2x$$

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

اما در مجموع جواب داده شده مقدار $\sin 2x$ که در معجزه ما باشد صفر است و تعریف شده است پس از آن معجزه ما جواب ندارد.

$$[-\pi, \frac{\pi}{2}]$$

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

$$2 \cos \frac{x}{2} + 1 = 0 \Rightarrow 2 \cos \frac{x}{2} (\cos \frac{x}{2} + 1) = 0 \Rightarrow \cos \frac{x}{2} = -\frac{1}{2} = \cos \frac{2\pi}{3}$$

$$\frac{x}{2} = 2k\pi \pm \frac{2\pi}{3} \Rightarrow x = 4k\pi \pm \frac{4\pi}{3}$$

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

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

$$-\sin 2x = \sin 2x \cdot \cos 2x \Rightarrow \cos 2x = -1 \Rightarrow \cos 2x = \cos \pi \Rightarrow$$

$$\sin 2x = 0 \Rightarrow \sin x = 0 \Rightarrow \sin x = \sin \pi$$

$$x = 2k\pi + \pi \Rightarrow x = k\pi$$

$$k = 0 \Rightarrow x = 0$$

$$k = 1 \Rightarrow x = \pi$$

$$k = 2 \Rightarrow x = 2\pi$$

جواب دارد

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$$\frac{1-\tan x}{1+\tan x} = \tan^2 x \Rightarrow \tan\left(\frac{\pi}{2} - x\right) = \tan^2 x \Rightarrow$$

$$2x = k\pi + \frac{\pi}{2} - x \Rightarrow 3x = k\pi + \frac{\pi}{2} \Rightarrow x = \frac{k\pi}{3} + \frac{\pi}{6} \quad k \in \mathbb{Z}$$

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

[0, π]

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

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

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

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

$$\sin^2 x = \sin^2 \frac{\pi}{4} \Rightarrow 2x = 2k\pi + \frac{\pi}{4} \Rightarrow x = k\pi + \frac{\pi}{8}$$

$$2x = 2k\pi + \frac{3\pi}{4} \Rightarrow x = k\pi + \frac{3\pi}{8}$$

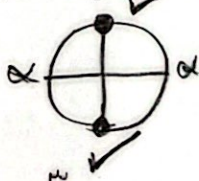
به ازای $\cos x = \frac{5x}{12}$ متهم مرتکب جرمی است

جواب ها: $\frac{\pi}{12}$ و $\frac{5\pi}{12}$ و $\frac{3\pi}{4}$ و $\frac{7\pi}{12}$: جواب

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

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

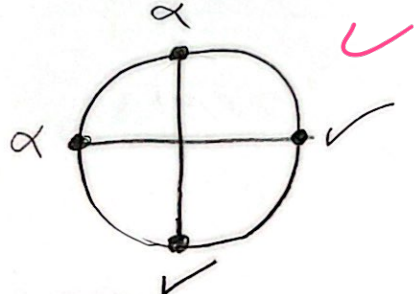


از این روش می توانیم دو نقطه را بیابیم

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

$$x = 2k\pi$$

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



$$\frac{Y \sin x_n \cos x_n + \sin x_n}{\sin x_n} = \sin x_n + c \cdot \sin x_n$$

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

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