

نام و نام خانوادگی نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۱۶ ... کلاس ... (با دقت بخوانید)

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

$(\sin x + 2)(\sin x - 1) = 0 \rightarrow \sin x = \frac{-2}{1}, \frac{1}{1} \rightarrow x = \left\{ 2k\pi + \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4} \right\}$ ۲

ب) $\cos^2 x + \cos x - 2 = 0 \rightarrow 2 \cos^2 x + \cos x - 2 = 0 \xrightarrow{\text{عوضه}} \cos x = 1 \text{ یا } \frac{-1}{2} \rightarrow \text{جواب}$

$\rightarrow x = 2k\pi$ ✓

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الف) $\sin^2 x - \cos^2 x = \sin x \rightarrow \frac{\sin^2 x - \cos^2 x}{-\cos^2 x} = \frac{\sin x}{-\cos^2 x} \rightarrow \sin x = \frac{1}{\cos^2 x} \rightarrow$

$x = \left\{ 2k\pi - \frac{\pi}{4}, 2k\pi - \frac{5\pi}{4} \right\} \rightarrow x = \left\{ k\pi - \frac{\pi}{4}, k\pi - \frac{5\pi}{4} \right\}$ ۲

ب) $2 \cos^2 \alpha - 1 + \sin \alpha \cos \alpha = 0 \rightarrow \cos^2 \alpha + \sin \alpha \cos \alpha = 0 \rightarrow$  $\alpha = k\pi + \frac{\pi}{2} \rightarrow$

$\alpha = \frac{k\pi}{2} + \frac{\pi}{4}$ ✓

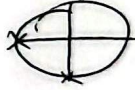
آنها $\cos = 1$ باشد $\sin = 0$ است و عبارت تعریف نشده می‌شود

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الف) $\cot x (2 \cos x + 1) = \frac{1}{\sin x} \rightarrow \frac{\cos x (2 \cos x + 1)}{\sin x} = \frac{1}{\sin x} \rightarrow 2 \cos x + \cos^2 x - 1 = 0 \rightarrow$

$\cos x = -1 \text{ یا } \frac{1}{2} \rightarrow x = \left\{ 2k\pi + \pi, 2k\pi \pm \frac{\pi}{3} \right\}$ (۱۷۵)

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

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

$\alpha = \left\{ k\pi + \pi, k\pi + \frac{3\pi}{2} \right\} \rightarrow \alpha = \left\{ k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right\}$

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الف) $\cos \left(\frac{\pi}{2} + x \right) \cos \left(x - \frac{\pi}{2} \right) = \frac{1}{2} \rightarrow 2 \sin \left(x + \frac{\pi}{2} \right) \cos \left(x + \frac{\pi}{2} \right) = \frac{1}{2} \rightarrow \sin \left(x + \frac{\pi}{2} \right) = \frac{1}{4} \rightarrow$

$\cos x = \frac{1}{4} \rightarrow x = \left\{ 2k\pi \pm \frac{\pi}{4} \right\} \rightarrow x = \left\{ k\pi \pm \frac{\pi}{4} \right\}$ جواب

ب) $\cos \left(x - \frac{\pi}{4} \right) = \cos \left(x + \frac{\pi}{4} \right) \rightarrow x - \frac{\pi}{4} = 2k\pi \pm \left(x + \frac{\pi}{4} \right) \rightarrow$

$x = 2k\pi - \frac{\pi}{4} + \frac{\pi}{4} \rightarrow x = \frac{(2k-1)\pi}{2}$ ✓

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

$\cos^2 x - 2 \sin^2 x + 1 = 0 \rightarrow 2 \sin^2 x = 2 \rightarrow \sin^2 x = 1 \rightarrow \sin x = \pm 1 \rightarrow$

$x = \left\{ 2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2} \right\}$ ✓

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$\frac{\sin \alpha}{1 + \cos \alpha} = \frac{1 + \cos \alpha}{\sin \alpha} \rightarrow \sin^2 \alpha = \cos^2 \alpha + 1 + 2 \cos \alpha \rightarrow 2 \cos^2 \alpha + 2 \cos \alpha = 0 \rightarrow$ $2 \cos \alpha (\cos \alpha + 1) = 0 \rightarrow \cos \alpha = 0 \vee -1 \rightarrow \cos \frac{x}{2} = \{0, -1\}$ دوره: $[-\pi, \frac{\pi}{2}]$ ✓ $- \pi - \pi = 2\pi$ ✓	6
$\cos^2 x - \sin^2 x \cos^2 x = 1 \rightarrow \sin^2 x \cos^2 x \cdot \frac{\cos^2 x}{-\sin^2 x} = 1 \rightarrow \sin^2 x (\cos^2 x + 1) = 0 \rightarrow$ $\sin^2 x = 0 \vee \cos^2 x = -1 \rightarrow x = \{k\pi\} \vee x = \{2k\pi + \pi\} \rightarrow x = \{\frac{2k\pi}{2} + \frac{\pi}{2}\} \Rightarrow$ $\hookrightarrow x = 0, \pi, 2\pi$ دوره: $x = \{\frac{2k\pi}{2} + \frac{\pi}{2}, k\pi\}$ ✓ $x = \frac{\pi}{2}, \pi, \frac{3\pi}{2}$ دوره: $[0, 2\pi]$ ✓	7
$\frac{1 - \tan x}{1 + \tan x} = \tan x \xrightarrow{\tan \frac{\pi}{4} = 1} \frac{\tan \frac{\pi}{4} - \tan x}{1 + \tan \frac{\pi}{4} \tan x} = \tan \pi \rightarrow$ $\tan(\frac{\pi}{4} - x) = \tan \pi \rightarrow \pi = k\pi + \frac{\pi}{4} - x \rightarrow x = k\pi + \frac{\pi}{4} \rightarrow$ $x = \frac{k\pi}{4} + \frac{\pi}{4} \quad \checkmark$	8
$\sqrt{\sin^2 x + \cos^2 x + 2 \sin x \cos x} = \sqrt{2} (\cos x - \sin x) \rightarrow \sin x + \cos x = \sqrt{2} (\sin x - \cos x)$ اگر $\sin x + \cos x \geq 0$ $\rightarrow \sqrt{2} \cos x = \sqrt{2} \sin x \rightarrow \cos x = \sin x \rightarrow x = \{2k\pi + \frac{\pi}{4}\}$ اگر $\sin x + \cos x < 0$ $\rightarrow \sqrt{2} \cos x = -\sqrt{2} \sin x \rightarrow \sin x = -\cos x \rightarrow x = \{2k\pi - \frac{\pi}{4}\}$ دوره: $[0, \pi]$ ✓	9
الف) $\sin^2 x - \cos^2 x = 1 \rightarrow \sin^2 x - \cos^2 x = -1 \rightarrow -\cos^2 x = 1 \rightarrow \cos^2 x = -1 \rightarrow x = \{2k\pi + \pi\}$ $\alpha = \{k\pi + \frac{\pi}{2}\}$ ✓ ب) $\sin^2 x - \cos^2 x = -1$ $\left. \begin{array}{l} \cos^2 x = 1, \sin^2 x = 0 \rightarrow x = 0, 2\pi \\ \cos^2 x = 0, \sin^2 x = 1 \rightarrow x = \frac{\pi}{2} \end{array} \right\} x = \{0, \frac{\pi}{2}, 2\pi\}$ ✓ دوره: $[0, 2\pi]$ ✓	10

$$\sqrt{1 + \sin 2x} = \sqrt{2} \cos x \xrightarrow{\text{توان ۲}} 1 + \sin 2x = 2 \cos^2 x$$

سوال ۹

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

$$\sin 2x = -1 \rightarrow 2x \in 2k\pi - \frac{\pi}{2} \quad \begin{matrix} 0 \leq x \leq \pi \\ k \in \mathbb{Z} \end{matrix} \rightarrow x = \frac{3\pi}{4}$$

$$\hookrightarrow \sin 2x = \frac{1}{2}$$

$$\sin 2x = \frac{1}{2} \rightarrow 2x \in 2k\pi + \frac{\pi}{6} \quad \begin{matrix} 0 \leq x \leq \pi \\ k \in \mathbb{Z} \end{matrix} \rightarrow x = \frac{\pi}{12} \quad \text{و} \quad \frac{5\pi}{12}$$

چون عبارت به توان ۲ رسیده است جواب زاویه تولید می‌کنند
به ازای $x = \frac{5\pi}{12}$ $\cos 2x$ منفی می‌شود پس چون جواب را اشیای است می‌دز است

* معادله ۲ جواب دارد