نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..۱۶.. کلاس .....

آفرین خیلی خوب نوشتی 👍 ۱۹/۷۵

**۱**

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

$\frac{-3 \pm \sqrt{25}}{4}$ $\begin{cases} \frac{1}{2} & \checkmark \\ -2 & \times \end{cases}$

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

ب) $2\cos^2 - 1 + \cos - 2 = 0 \Rightarrow 2\cos^2 + \cos - 3 = 0$

$\Rightarrow$ هیچ‌صباب $\begin{cases} \cos = 1 & \checkmark \\ \cos = -\frac{3}{2} & \times \end{cases}$ $2k\pi$ ✓

(۲)

**۲**

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

$2x = k\pi + \frac{\pi}{2} \Rightarrow x = \frac{k\pi}{2} + \frac{\pi}{4}$ ✓ ($\cos 2x = 0$)

$2x = 2k\pi - \frac{\pi}{6} \Rightarrow x = k\pi - \frac{\pi}{12}$ ✓ ($\sin 2x = -\frac{1}{2}$)

$2x = 2k\pi + \pi + \frac{\pi}{6} \Rightarrow x = k\pi + \frac{7\pi}{12}$ ✓

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

$\Rightarrow \sqrt{2}\sin\left(2x + \frac{\pi}{4}\right) = 0 \Rightarrow 2x + \frac{\pi}{4} = k\pi \Rightarrow x = \frac{k\pi}{2} - \frac{\pi}{8}$ ✓

(۲)

**۳**

الف) $2\cos + 1 = \frac{1}{\frac{\sin}{\cos}} = \frac{1}{\cos} \xrightarrow{\times\cos} 2\cos^2 + \cos - 1 = 0$ $\frac{-1 \pm \sqrt{1+8}}{4}$ $\begin{cases} \frac{1}{2} \\ -1 \end{cases}$

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

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

پس جواب غیرقابل قبول مصوب می‌شود

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

$\cos(\cos + \sin) = 0$ $\cos = 0$ ، $\sqrt{2}\sin\left(x + \frac{\pi}{4}\right) = 0$

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

(۱/۷۵)

**۴**

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

$\frac{1}{2}\sin\left(2x + \frac{\pi}{2}\right) = \frac{1}{4} \xrightarrow{\times 2} \sin\left(2x + \frac{\pi}{2}\right) = \frac{1}{2} \Rightarrow 2x + \frac{\pi}{2} = 2k\pi + \frac{\pi}{6}$

$\Rightarrow x = k\pi - \frac{\pi}{6}$ ، $2x + \frac{\pi}{2} = 2k\pi + \frac{5\pi}{6} \Rightarrow x = k\pi + \frac{\pi}{6}$ ✓

(۲)

ب) $\sin\left(\frac{\pi}{2} - 2x + \frac{\pi}{9}\right) = -\sin 2x \Rightarrow \sin\left(\frac{19\pi}{18} - 2x\right) = \sin(-2x)$

$\frac{19\pi}{18} - 2x = 2k\pi - 2x$ ✗ $\frac{19\pi}{18} - 2x = 2k\pi + \pi + 2x \Rightarrow x = \frac{k\pi}{2} + \frac{\pi}{72}$ ✓

**۵**

$\frac{2\sin 2x\cos 2x + \sin 2x}{\sin 2x} = \sin^2 + \cos^2 \Rightarrow 2\cos 2x = 0$

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

(۲)

**۶**

$$\tan\frac{x}{4} = \frac{1+\cos\frac{x}{2}}{\sin\frac{x}{2}} = \cot\frac{x}{4} = \frac{1}{\tan\frac{x}{4}}$$

$$\tan^2\frac{x}{4} = 1 \Rightarrow \tan\frac{x}{4} = \pm 1 \Rightarrow x = 4k\pi \pm \pi$$

$$|\pi - (-\pi)| = 2\pi$$ ✓

گزینه ۲

**۷**

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

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

$\sin^2 x = 0$ یا $\cos 3x = -1$

$x = k\pi$

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

$x = \pi, 2\pi, \frac{\pi}{3}, 0, \frac{5\pi}{3}$

گزینه ۲

**۸**

$$\frac{\frac{\cos x}{\cos x} - \frac{\sin x}{\cos x}}{\frac{\cos x}{\cos x} + \frac{\sin x}{\cos x}} = \frac{\sin 3x}{\cos 3x} \Rightarrow \frac{\cos^x - \sin x}{\cos x + \sin x} = \frac{\sin 3x}{\cos 3x}$$

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

$\cos x\cos 3x - \sin x\sin^2 x = \cos x\sin^2 x + \sin x\cos 3x$ $\quad \cos 4x = \sin 4x$

$\Rightarrow \sin 4x - \cos 4x = 0 \Rightarrow \sqrt{2}\sin(4x - \frac{\pi}{4}) = 0$

$4x - \frac{\pi}{4} = k\pi \Rightarrow x = \frac{k\pi}{4} + \frac{\pi}{16}$ ✓

گزینه ۲

**۹**

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

$2x = 2k\pi + \frac{\pi}{2} - 4x \Rightarrow x = \frac{k\pi}{3} + \frac{\pi}{12}$

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

$\frac{\pi}{12}$ ✓ ، $\frac{5\pi}{12}$ ✗ ، $\frac{9\pi}{12}$ ✓ ، $\frac{\pi}{4}$ ✗

۲ جواب ✓

گزینه ۲

**۱۰**

الف) حدود: $-\cos 2x = 1 \Rightarrow \cos 2x = -1 \quad 2x = 2k\pi + \pi$

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

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

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

$\Rightarrow \frac{1}{4}\sin 2x + 1 = \frac{1}{1 - \sin 2x} \Rightarrow \frac{1}{4}\sin 2x = \frac{1 - 1 + \sin 2x}{1 - \sin 2x} \Rightarrow \frac{1}{4} = \frac{1}{1 - \sin 2x}$ ✓

$\Rightarrow \sin 2x = -3$ ✗

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

گزینه ۲

در سوالات به فرم $\pm\sin^n x \pm \cos^n x$ برابر 1 یا 1- فقط کافی است نقاط اصرار!
چک کنی!

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

$x = 2\pi$ یا $0$

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