۱۶٫۷۵

نام و نام خانوادگی ......تارا رضائی...... پاسخنامه تشریحی تکلیف شماره ...۱۶... کلاس ...دوازدهم تجربی A...

**۱**

الف) $1-2\sin^2 x = 3\sin x - 1 \Rightarrow 2\sin^2 x + 3\sin x - 2 \Rightarrow (\sin + \frac{4}{2})(\sin - \frac{1}{2})$

$\sin = \frac{1}{2} \Rightarrow x = 2k\pi + \frac{\pi}{6}$, $x = 2k\pi + \frac{5\pi}{6}$

ب) $2\cos^2 x + \cos - 3$ $\quad \cos \begin{cases} 1 \\ -\frac{3}{2} \end{cases} \Rightarrow x = 2k\pi$

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الف) $\underbrace{(\sin^2 - \cos^2)}_{-\cos 2x}\underbrace{(\sin^2 + \cos^2)}_{1} = \sin 4x \Rightarrow \cos 2x = \sin(-4x)$

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

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

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

ب) $\underbrace{2\cos^2 x}_{1+\cos 2x} + \sin 2x = 1 \Rightarrow \cos 2x + \sin 2x = 0$

$\cos 2x = \cos(\frac{\pi}{2} + 2x)$ $\quad 2x = k\pi - \frac{\pi}{4} \Rightarrow x = \frac{k\pi}{2} - \frac{\pi}{8}$

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**۳**

الف) $\frac{\cos x}{\sin x}(2\cos x + 1) = \frac{1}{\sin x} \Rightarrow 2\cos^2 x + \cos x - 1$ $\quad \cos \begin{cases} -1 \Rightarrow 2k\pi + \pi & \text{غیرقابل قبول} \\ \frac{1}{2} \Rightarrow x = 2k\pi \pm \frac{\pi}{3} \end{cases}$

ب) $2\sin^2 x - \sin x\cos x + \cos^2 = \cancel{2}$

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

$2 + 2\tan^2 x$

$\tan = -1$

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

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**۴**

الف) $\cos(\frac{\pi}{4} + x)\cos(x - \frac{\pi}{4}) \xrightarrow{\text{ضرب به جمع}} \frac{1}{2}(\cos 2x + \underbrace{\cos\frac{\pi}{2}}_{0}) = \frac{1}{4}$

$\cos 2x = \frac{1}{2}$ $\quad 2x = 2k\pi \pm \frac{\pi}{3} \Rightarrow x = k\pi \pm \frac{\pi}{6}$

ب) $\cos(2x - \frac{\pi}{9}) = \sin(-2x) = \cos(\frac{\pi}{2} + 2x)$

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

$x = \frac{k\pi}{2} - \frac{7\pi}{72}$

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**۵**

$\frac{\sin 4x + \sin 2x}{\sin 2x} = \underbrace{\cos^2 x + \sin^2 x}_{1} \Rightarrow \sin 4x + \cancel{\sin 2x} = \cancel{\sin 2x} \Rightarrow \sin 4x = 0$

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

۱٫۵

اگر $\sin 4x$ برابر صفر باشد در برخی از جواب‌ها
$\sin 2x$ هم صفر می‌شود که غ ق ق است چون
مخرج عبارت اول صفر می‌شود!

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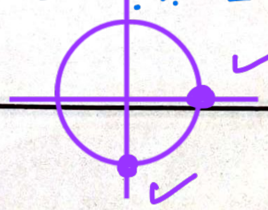
|---|---|
| $\frac{\sin\frac{x}{2}}{1+\cos\frac{x}{2}} = \frac{1+\cos\frac{x}{2}}{\sin\frac{x}{2}} \Rightarrow \cancel{\sin^2\frac{x}{2}} = \cos^2\frac{x}{2} + 2\cos\frac{x}{2} + 1$<br>$1-\cos^2\frac{x}{2}$<br>$2\cos^2\frac{x}{2} + 2\cos\frac{x}{2} = 0 \quad 2\cos\frac{x}{2}(\cos\frac{x}{2}+1)$    $\cos\frac{x}{2}=0 \quad x = 2k\pi + \pi$    2<br>$\pi$ و $-\pi$ ⇐ $\{-\pi, \frac{3\pi}{2}\}$ جواب ها در بازه ⇐ $\cos\frac{x}{2} = -1 \quad \frac{x}{2} = 2k\pi + \pi$<br>$\Downarrow$<br>تفاضل $= 2\pi$    $x = 4k\pi + 2\pi$ | 6 |
| $\cancel{\cos^2 x} - \sin^2 x \cos 3x = 1 \Rightarrow -\sin^2 x(1+\cos 3x) = 0$    1,5<br>$\cancel{1}-\sin^2 x$    $\cancel{\sin 2x} = 0 \quad x = k\pi \Rightarrow x = \frac{k\pi}{2} \Rightarrow 0$ و $\cancel{\frac{\pi}{2}}$ و $\pi$ و $\cancel{\frac{3\pi}{2}}$ و $2\pi$<br>$\sin^2 x$<br>$\cos 3x = -1 \Rightarrow 3x = 2k\pi + \pi \Rightarrow x = \frac{2k\pi}{3} + \frac{\pi}{3} \Rightarrow \frac{\pi}{3}$ و $\pi$ و $\frac{5\pi}{3}$<br>$\sin^2 x = 0 \rightarrow \sin x = 0 \rightarrow x = 0, \pi, 2\pi$<br>جواب در این بازه ~~6~~ 5 | 7 |
| $\frac{\frac{\cos - \sin}{\cos}}{\frac{\cos + \sin}{\cos}} = \frac{\cos x - \sin x}{\cos x + \sin x} = \tan 3x$    /5 | 8 |
| جواب ۲) $1 + \sin 3x = 2\cos^2 3x \Rightarrow 2\sin^2 3x + \sin 3x - 1 = 0$<br>$2 - 2\sin^2 3x$<br>$\sin 3x \begin{cases} -1 \Rightarrow x = k\pi - \frac{\pi}{6} & \text{ق ق} \\ \frac{1}{2} \Rightarrow x = k\pi + \frac{\pi}{12} & \text{ق ق} \\ x = k\pi + \frac{5\pi}{12} & \text{غ ق غ} \end{cases}$    2<br>$\frac{\pi}{12}$ و $\frac{3\pi}{4}$ = جواب ها در این بازه<br>۲ جواب | 9 |
| الف) $\sin^2 x - \cos^2 x = 1 \Rightarrow -\cos 2x = 1 \Rightarrow \cos(\pi - 2x) = 1$<br>$\pi - 2x = 2k\pi \quad x = \frac{2k\pi}{2} + \frac{\pi}{2} \Rightarrow \frac{\pi}{2}$ و $\frac{3\pi}{2}$    1,25<br>ب) $(\sin x - \cos x)(\cancel{\sin^2 x + \cos^2 x} + \sin x\cos x) = -1$<br>در سوالات به فرم $\pm\sin^n x \pm \cos^n x$ برابر 1 یا -1 فقط کافی است نقاط اصلی را چک کنی!<br>$\sin^3 x - \cos^3 x = 1$ | 10 |



$x = 2\pi$ یا $0$

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

سوال ۵

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

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

$$2x = k\pi + \frac{\pi}{2} \rightarrow \boxed{x = k\pi + \frac{\pi}{4}}$$

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سوال ۸

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

$$\tan\left(\frac{\pi}{4} - x\right) = \tan 3x \rightarrow \frac{\pi}{4} - x = k\pi + 3x$$

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

$$\boxed{x = \frac{k\pi}{4} + \frac{\pi}{16}}$$