۱۸٫۵

نام و نام خانوادگی ....   پاسخنامه تشریحی تکلیف شماره ۱۰ ... کلاس دوازدهم ریاضی ....

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الف)

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

$\Rightarrow \sin x = \frac{1}{2} \Rightarrow x = 2k\pi + \frac{\pi}{6}$ یا $x = 2k\pi + \pi - \frac{\pi}{6}$

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

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ب)

$2\cos^2 x + \cos x - 3 = 0 \Rightarrow \cos x = 1$ ، $\cos x = -\frac{3}{2}$

$\cos x = 1 \Rightarrow x = 2k\pi$

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الف)

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

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

① $\cos 2x = 0 \Rightarrow 2x = k\pi + \frac{\pi}{2} \Rightarrow x = \frac{k\pi}{2} + \frac{\pi}{4}$

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

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

②

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ب)

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

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

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الف)

$2\cos^2 x + \cos x - 1 = 0$

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

$\cos x = -1 \Rightarrow 2k\pi + \pi$ ✗ مخرج صفر

ب)

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

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

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

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

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الف)

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

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

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

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ب)

$\cos(2x - \frac{\pi}{9}) = \cos(2x + \frac{\pi}{4})$

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

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

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

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$\frac{2\sin 2x \cos 2x + \sin 2x}{\sin 2x} = \cos^2 x + \sin^2 x \Rightarrow 2\cos 2x + 1 = 1 \Rightarrow \cos 2x = 0$

$\Rightarrow 2x = k\pi + \frac{\pi}{2} \Rightarrow x = \frac{k\pi}{2} + \frac{\pi}{4}$ (همه‌ی نقاط جواب در دامنه ($\sin 2x \neq 0$) صدق می‌کنند)

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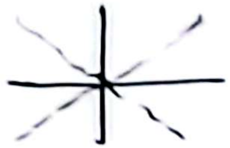
$$\tan\left(\frac{x}{4}\right) = \frac{1+\cos\frac{x}{2}}{\sin\frac{x}{2}} \Rightarrow \tan\left(\frac{x}{4}\right) = \frac{1}{\tan\left(\frac{x}{4}\right)} \Rightarrow \tan^2\left(\frac{x}{4}\right) = 1$$

$$\tan\left(\frac{x}{4}\right) = \pm 1 \Rightarrow \frac{x}{4} = \frac{k\pi}{2} + \frac{\pi}{4} \Rightarrow \boxed{x = 2k\pi + \pi}$$



$$\Rightarrow x = 2k\pi + \pi \Rightarrow \begin{array}{c|cc} k & -1 & 0 \\ \hline x & -\pi & \pi \end{array} \Rightarrow |\pi + \pi| = 2\pi$$

$$\left.\begin{array}{l} -\sin^2 x \cos 3x = 1 - \cos^2 x \\ \sin^2 x (1 + \cos 3x) = 0 \end{array}\right\} \rightarrow$$

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

(۲) $\sin^2 x = 0 \Rightarrow x = k\pi$

(۱) $\begin{array}{c|ccc} k & 0 & 1 & 2 \\ \hline x & \frac{\pi}{3} & \pi & \frac{5\pi}{3} \end{array}$

(۲) $\begin{array}{c|ccc} k & 0 & 1 & 2 \\ \hline x & 0 & \pi & 2\pi \end{array}$

سه

۵ جواب متمایز

$$\frac{1-\tan x}{1+\tan x} = \tan\left(\frac{\pi}{4} - x\right) = \tan 3x \Rightarrow 3x = k\pi + \frac{\pi}{4} - x$$

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

همه‌ی نقاط در دامنه صدق می‌کنند ۸

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$x = 0 \Rightarrow \sin^3 x - \cos^3 x = -1$ ✓

$\boxed{x = \frac{\pi}{2}} \Rightarrow 1 - 0 = 1$ ✗

$x = \frac{3\pi}{2} \Rightarrow 0 + 1 = 1$ ✗

$\boxed{x = \frac{3\pi}{2}} \Rightarrow -1 - 0 = -1$ ✓

الف)

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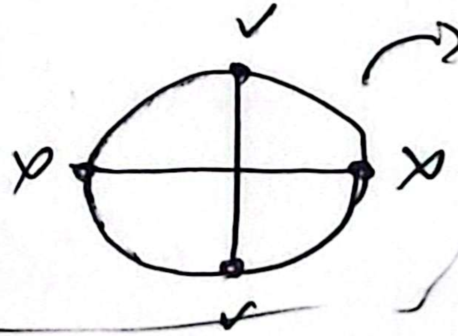
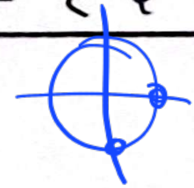


$\to k\pi + \frac{\pi}{2}$

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

$\Rightarrow [0, 2\pi] \Rightarrow x = \{\frac{\pi}{2}, \frac{3\pi}{2}\}$

ب)



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