۱۷,۷۵

نام و نام خانوادگی آرش سلطانی ...... پاسخنامه تشریحی تکلیف شماره ۱۶ کلاس دوازدهم پسر A

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الف) $\to 1-2\sin^2 x=3\sin x-1$

$\to 2\sin^2 x+3\sin x-2=0 \to \sin x=\begin{cases}-2 & \text{غ ق ق}\\ \frac{1}{2}\end{cases}$

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

ب) $\to 2\cos^2 x-1+\cos x-2=0$

$\to 2\cos^2 x+\cos x-3=0$ $a+b+c=0$

$\to \cos x=1\ ,\ -\frac{3}{2}$ غ ق ق

$\to x=2k\pi$

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الف) $\to \sin^2 x-\cos^2 x=-\cos 2x=\sin 4x=2\sin 2x\cos 2x$

$\to \cos 2x(2\sin 2x+1)=0 \to \cos 2x=0 \to x=\frac{k\pi}{2}+\frac{\pi}{4}$

$\to \sin 2x=-\frac{1}{2} \to 2x=2k\pi-\frac{\pi}{6}\ ,\ 2k\pi-\frac{5\pi}{6}$

$x=k\pi-\frac{\pi}{12}$ $x=k\pi-\frac{5\pi}{12}$

ب) $\to \cos^2 x-\sin^2 x+2\sin x\cos x$

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

$\to 2x=k\pi-\frac{\pi}{4} \to x=\frac{k\pi}{2}-\frac{\pi}{8}$

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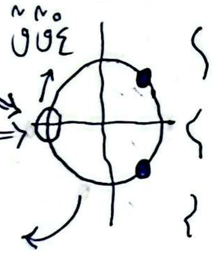
الف) $\to \frac{2\cos^2 x+\cos x-1}{\sin x}=0$ $\sin x\neq 0$ غ ق ق

$\to \cos x=-1\ ,\ \cos x=\frac{1}{2} \Rightarrow$



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

ب) $\xrightarrow{\div \sin^2 x} 2-\cot x+\cot^2 x=2(1+\cot^2 x)$

$\to \cot x(\cot x+1)=0 \to \cot x=0 \to x=k\pi+\frac{\pi}{2}$

$\cot x=-1 \to x=k\pi+\frac{3\pi}{4}$

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الف) $\to \cos(\frac{\pi}{4}+x)\sin(\frac{\pi}{4}+x)=\frac{1}{4}$

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

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

ب) $\cos(2x-\frac{\pi}{6})=-\cos(\frac{\pi}{2}-2x)$

$=\cos(\pi-(\frac{\pi}{2}-2x)) \to \cos(2x-\frac{\pi}{6})=\cos(\frac{\pi}{2}+2x)$

$2x-\frac{\pi}{6}=2x+\frac{\pi}{2}$ غ ق ق

$2x-\frac{\pi}{6}=2k\pi-2x-\frac{\pi}{2} \to x=\frac{k\pi}{2}-\frac{\pi}{12}$

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$\to \frac{\sin 4x+\sin 2x}{\sin 2x}=1 \to 2\sin 2x\cos 2x+\sin 2x=\sin 2x\ (\sin 2x\neq 0)$

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$\sin 4x=0 \to$ $\cancel{4}\,2x=k\pi+\frac{\pi}{2} \to x=\frac{k\pi}{4}+\frac{\pi}{8}$ ۵

$k=0 \to x=\pi$ $\qquad k=-1 \to x=-\pi$ $\qquad |-1-\pi| = 2\pi$

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

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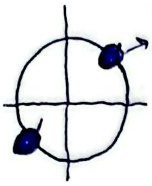

$\frac{\pi}{4}$, $\frac{5\pi}{4}$

$$\left.\begin{array}{l} \frac{\pi}{4} = \frac{x}{4} \to x=\pi \\ \frac{5\pi}{4} = \frac{5\pi}{4} \to x = 5\pi \end{array}\right\} \to |5\pi - \pi| = 4\pi$$

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

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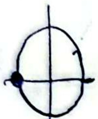
$\sin x = 0 \to k\pi$

$\cos 2x = -1 = \cos\pi \to 2k\pi + \pi$



$\frac{\pi}{2}, \frac{3\pi}{2}$

تعداد جواب ۴ در $[0, 2\pi]$

$0, \pi, 2\pi \Leftarrow$

~~۳~~ ۵ جواب دارد

$$\frac{1-\tan x}{1+\tan x} = \frac{\cos x - \sin x}{\cos x + \sin x} = \frac{\sin 3x}{\cos 3x} \to \cos 3x\cos x - \cos 3x \sin x = \sin 3x \cos x + \sin 3x \sin x$$

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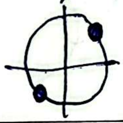
$$\to \cos 3x \cos x - \sin 3x \sin x = \sin 3x \cos x + \cos 3x \sin x \to \boxed{\cos 4x = \sin 4x}$$



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

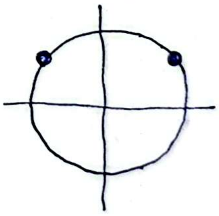
$$1 + \sin 2x = 2\cos^2 2x = 2(1-\sin^2 2x) = 2 - 2\sin^2 2x$$

توان ۲

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

$\sin x = -1$ ✗

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



$\frac{\pi}{6}$ و $\frac{5\pi}{6}$

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دو جواب

$\sin 2x = -1 \to 2x = k\pi - \frac{\pi}{4} \to \frac{3\pi}{4}$

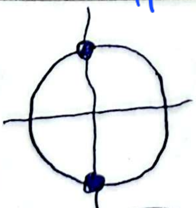
$x = k\pi + \frac{\pi}{12} \to \frac{\pi}{12}$

الف) $\sin^4 x - \cos^4 x = 1$

جواب‌ها:

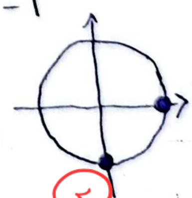
$x = \frac{\pi}{2} \to 2k\pi + \frac{\pi}{2}$

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



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

ب) $\sin^3 x - \cos^3 x = -1$



۳ جواب دارد:

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

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