نام و نام خانوادگی آیین غضنفری سوادکوهی پاسخنامه تشریحی تکلیف شماره ۱۱ کلاس دوازدهم B

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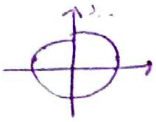
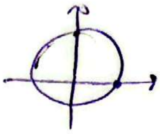
الف) $\cos 2\alpha = 3\sin\alpha - 1 \rightarrow 1 - 2\sin^2\alpha = 3\sin\alpha - 1$

$2\sin^2\alpha + 3\sin\alpha - 2 = 0 \rightarrow \Delta = 25$ ریشه ها $\rightarrow -2 \times ,\ \frac{1}{2}$

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

ب) $\cos 2\alpha + \cos\alpha - 2 = 0 \rightarrow 2\cos^2\alpha + \cos\alpha - 3 = 0$

$\Delta = 25$ ریشه ها $\rightarrow -\frac{3}{2} \times ,\ 1 \checkmark$ $\quad \cos\alpha = 1$

 $\{2k\pi\}$

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$-(\cos^2\alpha + \sin^2\alpha)(\cos^2\alpha - \sin^2\alpha) = \sin 4\alpha$

$\sin 4\alpha = -\cos 2\alpha \rightarrow \sin 4\alpha = \sin(\frac{\pi}{2} - 2\alpha)$

(1: $4\alpha = 2k\pi + \frac{\pi}{2} - 2\alpha) \rightarrow \alpha = \frac{k\pi}{3} + \frac{\pi}{12}$

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

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

$\sin 2\alpha = \cos 2\alpha \rightarrow 2\alpha = k\pi + \frac{\pi}{4}$

$\alpha = \frac{k\pi}{2} + \frac{\pi}{8}$

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

$\cos x(2\cos x + 1) = 1 \rightarrow 2\cos^2 x + \cos x - 1 = 0 \rightarrow -1 \times ,\ \frac{1}{2}$

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

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

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

$\sin^2(\frac{\pi}{4} + x) = \frac{1}{4} \quad \sin(\frac{\pi}{4} + x) = \pm\frac{1}{2}$

$x + \frac{\pi}{4} = 2k\pi + \frac{\pi}{6} \rightarrow x = k\pi - \frac{\pi}{12}$

$x + \frac{\pi}{4} = k\pi - \frac{\pi}{6} \rightarrow x = k\pi - \frac{5\pi}{12}$

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

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

$4x = 2k\pi - \frac{7\pi}{18} \rightarrow x = \frac{k\pi}{2} - \frac{7\pi}{72}$

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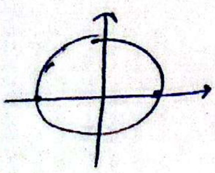
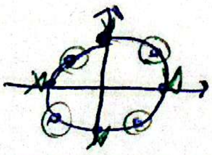
$\frac{\sin 4x + \sin 2x}{\sin 2x} - \sin^2 x = \cos^2 x \rightarrow \frac{\sin 4x}{\sin 2x} + 1 = 1 \rightarrow \frac{\sin 4x}{\sin 2x} = 0$

$0 \neq \sin 2x ,\ 0 = \sin 4x$



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

$2x \neq k\pi \rightarrow x \neq \frac{k\pi}{2}$

 $\rightarrow x = k\pi \pm \frac{\pi}{4}$

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

$\Rightarrow \tan^2\frac{x}{2} = 1 \to \tan\frac{x}{2} = \pm 1 \quad \frac{x}{2} = k\pi \pm \frac{\pi}{4}$; $x = 2k\pi + \pi \to \pi$, $x = 2k\pi - \pi \to -\pi$

$|-\pi-\pi| = 2\pi$

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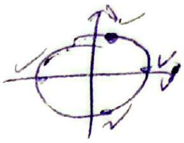
$\cos^2\alpha - \sin^2\alpha\cos 2\alpha = 1 \to \cos^2 - \sin^2\cos 2\alpha = \cos^2 + \sin^2\alpha$

$\cos 2\alpha = -1 \to 2x = 2k\pi + \pi \to x = \frac{2}{2}k\pi + \frac{\pi}{2}$

دو جواب



$\sin^3 x = 0$ چون دو طرف زدیم یعنی در نظر بگیریم

$x = k\pi$

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$\frac{1-\tan\alpha}{1+\tan\alpha} = \tan 2\alpha \to \tan(\frac{\pi}{4} - x) = \tan 2x \to 2x = k\pi + \frac{\pi}{4} - x$

$\to 3x = k\pi + \frac{\pi}{4} \to x = \frac{k\pi}{3} + \frac{\pi}{12}$

$\cos x \neq 0 \to x \neq 2k\pi \pm \frac{\pi}{2}$

$\cos 2x \neq 0 \to x \neq 2k\pi \pm \frac{\pi}{4}$

$\tan x \neq -1 \to x \neq k\pi + \frac{3}{4}\pi$

$\Rightarrow x \neq \frac{k\pi}{2} \pm \frac{\pi}{4}$

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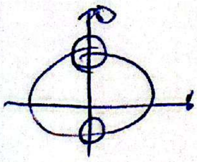
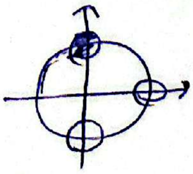
الف) $\sin^4\alpha - \cos^4\alpha = 1$ چهار نقطه اصلی را امتحان می‌کنیم



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

ب) $\sin^3\alpha - \cos^3\alpha = -1$



$\{2k\pi, 2k\pi - \frac{\pi}{2}\}$