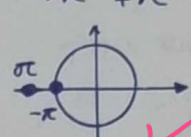
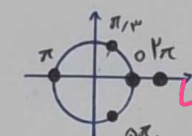
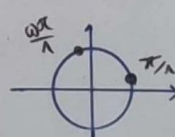
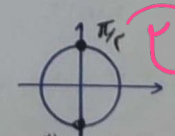
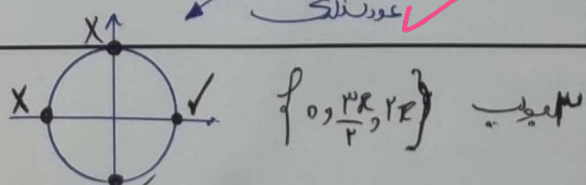


نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۱۱۱... کلاس: ۲۰	نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۱۱۱... کلاس: ۲۰
(ب) $2\cos^2 x - 1 + \cos x - 2 = 0$ $2\cos^2 x + \cos x - 3 = 0$ $\cos^2 x + \cos x - 4 = 0$ $(\cos x + 3)(\cos x - 2) = 0$ $\cos x = 1 = \cos 2\pi$ $\cos x \begin{cases} -3 \rightarrow -3/2 \\ 2 \rightarrow 1 \end{cases} \quad \text{غ} \quad x = 2k\pi$	(الف) $1 - 2\sin^2 x = 3\sin x - 1$ $2\sin^2 x + 3\sin x - 2 = 0$ $\sin^2 x + 3\sin x - 1 = 0$ $(2\sin x + 1)(\sin x - 1) = 0$ $\sin x \begin{cases} -1 \rightarrow -1 \\ 1 \rightarrow 1/2 \end{cases} \quad \text{غ} \quad x = \begin{cases} 2k\pi + \pi/4 \\ 2k\pi + 5\pi/4 \end{cases}$ 1
(ب) $2\cos^2 x - 1 + 2\sin x \cos x = 0$ $\cos^2 x + \sin^2 x = 0$ $\cos^2 x = -\sin^2 x$ $\tan^2 x = -1$ $2x = k\pi - \pi/4 \rightarrow x = \frac{k\pi}{2} - \frac{\pi}{4}$	(الف) $(\sin^2 x + \cos^2 x)(\sin^2 x - \cos^2 x) = 2\sin^2 x \cos^2 x$ $-\cos^2 x = 2\sin^2 x \cos^2 x$ $\cos^2 x = 0$ $2\sin^2 x = -1$ $\sin^2 x = -1/2$ $\begin{cases} 2x = k\pi \\ x = \frac{k\pi}{2} + \frac{\pi}{4} \end{cases}$ $2x = 2k\pi - \pi/4 \rightarrow x = k\pi - \pi/4$ $2x = 2k\pi - 5\pi/4 \rightarrow x = k\pi - 5\pi/4$ 2
(ب) $\sin^2 x + \sin^2 x + \cos^2 x - \sin x \cos x = 2$ $(1 - \cos^2 x) + 1 - \sin x \cos x = 2$ $-\cos^2 x = \sin x \cos x$ $-\cos x = \sin x$ $\tan x = -1 \rightarrow x = k\pi - \pi/4$	(الف) $2\sin x \rightarrow \cos x (2\cos x + 1) = 1$ $2\cos^2 x + \cos x - 1 = 0$ $\cos^2 x + \cos x - 2 = 0$ $(\cos x + 2)(\cos x - 1) = 0$ $\cos x \begin{cases} -2 \rightarrow -1 \\ 1 \rightarrow 1/2 \end{cases} \quad \text{غ} \quad \sin x \neq 0$ $\cos x = 1/2 = \cos \pi/3$ $x = 2k\pi \pm \pi/3$ 3
(ب) $\cos(2x - \frac{\pi}{4}) = \sin(-2x)$ $\cos(-\frac{\pi}{4} + (2x + \frac{\pi}{4})) = \sin(-2x)$ $\sin(2x + \frac{\pi}{4}) = \sin(-2x)$ $2x + \frac{\pi}{4} = 2k\pi + 2x$ $2x + \frac{\pi}{4} = 2k\pi - 2x$ $4x = 2k\pi - \frac{\pi}{4}$ $x = \frac{k\pi}{2} - \frac{\pi}{8}$	(الف) $\cos(\frac{\pi}{4} + x) \sin(\frac{\pi}{4} + x) = 1/4$ $1/2 \sin(2x + \pi/2) = 1/4$ $\cos 2x = 1/2 = \cos \pi/3$ $2x = 2k\pi \pm \pi/3 \rightarrow x = k\pi \pm \pi/6$ 4
(ب) $\frac{2\sin^2 x \cos^2 x + \sin^2 x}{\sin^2 x} = \sin^2 x + \cos^2 x$ $\sin^2 x (2\cos^2 x + 1) = 1$ $2\cos^2 x + 1 = 1$ $2\cos^2 x = 0$ $\cos^2 x = 0$	(الف) $2x = k\pi + \frac{\pi}{2}$ $x = \frac{k\pi}{2} + \frac{\pi}{4}$ $\sin^2 x \neq 0$ $2x \neq k\pi$ $x \neq k\pi/2$ 5

$\frac{\sin(x/2)}{1 + \cos x/2} = \frac{1 + \cos(x/2)}{\sin(x/2)} \quad x/2 = \theta$ $\sin^2 \theta = (1 + \cos \theta)^2$ $\sin^2 \theta = 1 + \cos^2 \theta + 2 \cos \theta$ $0 = 2 \cos^2 \theta + 2 \cos \theta$	$\cos x/2 = 0$ $x/2 = k\pi + \pi/2$ $x = 2k\pi + \pi$  حل
$-\sin^2 x \cos^3 x = 1 - \cos^2 x$ $-\sin^2 x \cos^3 x = \sin^2 x \quad \sin^2 x = 0 \quad \sin x = 0 \rightarrow x = k\pi$ $\cos^3 x = -1$ $\cos^3 x = \cos \pi \rightarrow 3x = 2k\pi + \pi$ $x = \frac{2k\pi}{3} + \frac{\pi}{3}$	 حل
$\frac{\cos x - \sin x}{\cos x} = \frac{\cos x - \sin x}{\cos x + \sin x} = \frac{-\sqrt{2} \sin(x - \pi/4)}{\sqrt{2} \sin(x + \pi/4)} = -\tan(x - \pi/4) = \tan 3x$ $\tan(x - \pi/4) = \tan(-3x)$ $\sin(x + \pi/4) = \cos(\pi/4 - x) = \cos(x - \pi/4)$ $x - \pi/4 = k\pi - 3x \rightarrow 4x = k\pi + \pi/4 \rightarrow x = \frac{k\pi}{4} + \frac{\pi}{16}$	حل
$1 + \sin^2 x = 2 \cos^2 x$ $\sin^2 x = 2 \cos^2 x - 1$ $\sin^2 x = \cos^2 x = \cos^2 x$ $\tan^2 x = 1$	$2x = k\pi + \pi/4$ $x = \frac{k\pi}{2} + \frac{\pi}{8}$  حل
 $(\sin x - \cos x)(\sin^2 x + \cos^2 x + \sin x \cos x) = -1$ $(\sin x - \cos x)(1 + \sin x \cos x) = -1$ $\sin x + \sin^2 x \cos x - \cos x - \sin x \cos^2 x = -1$ $\sin x \cos x (\sin x - \cos x) + \sin x - \cos x = -1$ $(\sin x - \cos x)(1 + \sin x \cos x) = 0$ حل	$(\sin^2 x + \cos^2 x)(\sin^2 x - \cos^2 x) = 1$ $-\cos^2 x = 1$ $\cos^2 x = -1$ $2x = 2k\pi + \pi$ $x = k\pi + \frac{\pi}{2}$  حل



$$\sqrt{1 + \sin 2x} = \sqrt{2} \cos x \xrightarrow{\text{توان ۲}} 1 + \sin 2x = 2 \cos^2 x$$

سوال ۹

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

$$\sin 2x = -1 \rightarrow 2x = 2k\pi - \frac{\pi}{2} \xrightarrow[k \in \mathbb{Z}}{0 \leq x \leq \pi} x = \frac{3\pi}{4} \quad \hookrightarrow \sin 2x = +\frac{1}{2}$$

$$\sin 2x = \frac{1}{2} \rightarrow 2x \in \left[k\pi + \frac{\pi}{6}, k\pi + \frac{5\pi}{6}\right] \xrightarrow[k \in \mathbb{Z}}{0 \leq x \leq \pi} x = \frac{\pi}{12} \cup \frac{5\pi}{12}$$

چون عبارت به توان ۲ رسیده است جواب زاویه تولید می‌کنند
به ازای $x = \frac{5\pi}{12}$ $\cos 2x$ منفی می‌شود پس چون جواب را ایجاب است نمی‌دزاست

* معادله ۲ جواب دارد