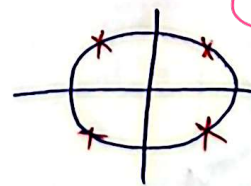


نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۱۹۰... کلاس: دبیر:
 نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۱۹۰... کلاس: دبیر:

(الف) $\sqrt{2} \sin x + \sqrt{2} \cos x = 2 \sin x \Rightarrow \frac{1}{\sqrt{2}} = \sin x \Rightarrow x = \frac{\pi}{4} + k\pi$ (ب) $\sqrt{2} \cos x + \cos x = 1 \Rightarrow \cos x = \frac{1}{\sqrt{2}} \Rightarrow x = \frac{\pi}{4} + k\pi$ (ج) $\cos x = 1 \Rightarrow x = 2k\pi$ ✓	۱
(الف) $-\cos x \sin x \cos x = \sin x \Rightarrow \sin x = \frac{1}{\sqrt{2}} \Rightarrow x = \frac{\pi}{4} + k\pi$ (ب) $\cos x \sin x = \frac{1}{\sqrt{2}} \Rightarrow \sin x = \frac{1}{\sqrt{2}} \Rightarrow x = \frac{\pi}{4} + k\pi$ (ج) $\cos x \sin x - \sin x = \sin x \Rightarrow \sin x = 0 \Rightarrow x = k\pi$	۲
(الف) $\sqrt{2} \cos x + \frac{1}{\cos x} = \sqrt{2} \cos x + \cos x - 1 = 0 \Rightarrow \cos x = 1 \Rightarrow x = 2k\pi$ (ب) $\cos x = \frac{1}{\sqrt{2}} \Rightarrow x = \frac{\pi}{4} + k\pi$ (ج) $\sqrt{2} \cos x - \sin x \cos x + \cos x = 1 \Rightarrow \cos x = 1 \Rightarrow x = 2k\pi$	۳
(الف) $\cos(\frac{\pi}{2} + x) \cos(\frac{\pi}{2} - x) = \frac{1}{2} \Rightarrow \frac{1}{2} \sin(x + \frac{\pi}{2}) = \frac{1}{2} \Rightarrow \sin(x + \frac{\pi}{2}) = 1 \Rightarrow x + \frac{\pi}{2} = \frac{\pi}{2} + 2k\pi \Rightarrow x = 2k\pi$ (ب) $\cos(x - \frac{\pi}{4}) = \cos(x + \frac{\pi}{4}) \Rightarrow x - \frac{\pi}{4} = x + \frac{\pi}{4} + 2k\pi \Rightarrow -\frac{\pi}{2} = 2k\pi \Rightarrow k = -\frac{1}{4}$	۴
$\sin x + \sin x = \sin x \Rightarrow \sin x = 0 \Rightarrow x = k\pi$ $\sin x \neq 0 \Rightarrow x \neq k\pi$ مجموع جوابات: $\frac{k\pi}{2} - \{ \frac{k\pi}{2} \}$ $\sqrt{2} \sin x \cos x + \sin x = \sin x \Rightarrow \sqrt{2} \sin x \cos x = 0 \Rightarrow \sin x = 0 \text{ or } \cos x = 0$	۵

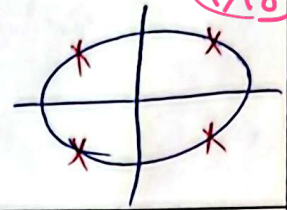


$$\frac{\sin(x + \frac{\pi}{2})}{\sin x} = 1 \Rightarrow \sin(x + \frac{\pi}{2}) = \sin x \Rightarrow \cos x = \sin x \Rightarrow x = \frac{\pi}{4} + k\pi$$

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

$$\tan \alpha \leq \frac{1 + \cos \frac{\pi}{r}}{\sin \frac{\pi}{r}} \Rightarrow \tan \alpha \leq \cot \alpha \Rightarrow \alpha \leq \frac{k\pi}{r} + \frac{\pi}{2}$$

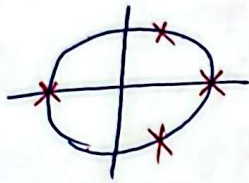
$$|-\frac{r\pi}{2} - (-\frac{\pi}{r}) - \frac{\pi}{r} - \frac{r\pi}{2} - \frac{\delta\pi}{r}| = \frac{11\pi}{r}$$



$$\cos^2 \alpha - \sin^2 \alpha \cos^2 \alpha = \sin^2 \alpha + \cos^2 \alpha \Rightarrow \sin^2 \alpha (1 + \cos^2 \alpha) = 0$$

$$\sin^2 \alpha = 0 \Rightarrow \alpha = k\pi$$

$$\cos^2 \alpha = 1 \Rightarrow \alpha = k\pi + \pi \Rightarrow \alpha = \frac{k\pi}{r} + \frac{\pi}{r}$$



حل ۴

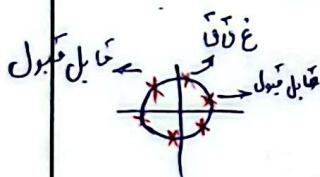
$$\tan(\alpha + \frac{\pi}{2}) = \frac{\tan \alpha + \tan \frac{\pi}{2}}{1 - \tan \alpha \tan \frac{\pi}{2}} = \frac{1 + \tan \alpha}{1 - \tan \alpha}$$

$$\tan(\alpha + \frac{\pi}{2}) = \tan \alpha$$

$$\alpha + \frac{\pi}{2} = k\pi + \alpha \Rightarrow \alpha = -\frac{k\pi}{r} + \frac{\pi}{r} = \frac{k\pi}{r} + \frac{\pi}{r}$$

$$\cos^2 \alpha = 0 \quad 1 + \sin^2 \alpha \leq \cos^2 \alpha \Rightarrow 1 + \sin^2 \alpha \leq 1 + \cos^2 \alpha \Rightarrow \sin^2 \alpha \leq \cos^2 \alpha$$

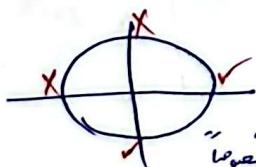
$$\sin^2 \alpha \leq 1 - \sin^2 \alpha \Rightarrow 2 \sin^2 \alpha \leq 1 \Rightarrow \sin^2 \alpha \leq \frac{1}{2} \Rightarrow \sin \alpha \leq \frac{1}{\sqrt{2}}$$



$$\begin{aligned} \sin^2 \alpha \leq \frac{1}{2} &\Rightarrow \sin \alpha \leq \frac{1}{\sqrt{2}} \Rightarrow \alpha \leq \frac{k\pi}{r} + \frac{\pi}{r} \\ \sin^2 \alpha \leq \frac{1}{2} &\Rightarrow \sin \alpha \geq -\frac{1}{\sqrt{2}} \Rightarrow \alpha \geq \frac{k\pi}{r} - \frac{\pi}{r} \end{aligned}$$

$$-\cos^2 \alpha \leq 1 \Rightarrow \cos^2 \alpha \leq 1 \Rightarrow \cos \alpha \leq 1 \Rightarrow \alpha \leq \frac{k\pi}{r} + \frac{\pi}{r}$$

$$\frac{\pi}{r}, \frac{r\pi}{r}$$



$$0, \frac{\pi}{r}, r\pi$$

برای مورد الف هم می‌توان از این راه رفت اما چون نمی‌دانیم که در هر دو مجموعه

نه نهایی و نه داره عاری حلش کردم روش حل مورد (ب) در نهایت به هم می‌رسیم

سوال 4

$$\frac{\sin \frac{\pi}{4}}{1 + \cos \frac{\pi}{4}} = \tan \frac{\pi}{8}$$

$$\frac{1}{\sin \frac{\pi}{4}} + \cot \frac{\pi}{4} = \frac{1 + \cos \frac{\pi}{4}}{\sin \frac{\pi}{4}} = \frac{1}{\tan \frac{\pi}{8}} = \cot \frac{\pi}{8}$$

$$\tan \frac{\pi}{8} = \cot \frac{\pi}{8} \rightarrow \tan \frac{\pi}{8} = \tan \left(\frac{\pi}{4} - \frac{\pi}{8} \right)$$

$$\frac{\pi}{8} = k\pi + \frac{\pi}{4} - \frac{\pi}{8} \rightarrow \frac{\pi}{8} = k\pi + \frac{\pi}{4} \rightarrow \pi = 2k\pi + \pi$$

$$\text{جواب } \rightarrow k=0 \rightarrow \pi = \pi$$

$$\rightarrow k=-1 \rightarrow \pi = -\pi \rightarrow \text{افتاد} = |\pi - (-\pi)| = 2\pi$$

سوال 7

$$\cos^2 u - \sin^2 u \cos^2 u = 1 \xrightarrow{\cos^2 u = 1 - \sin^2 u}$$

$$1 - \sin^2 u - \sin^2 u \cos^2 u = 1 \rightarrow \sin^2 u (1 + \cos^2 u) = 0 \rightarrow \sin u = 0$$

$$\sin u = 0 \rightarrow u = k\pi \rightarrow u = 0, \pi, 2\pi \rightarrow \cos^2 u = 1$$

$$\cos^2 u = 1 \rightarrow u = 2k\pi + \pi \rightarrow u = \frac{2k\pi + \pi}{2} \rightarrow u = \frac{\pi}{2}, \pi, \frac{3\pi}{2}$$

مقادیر جواب دارد

سوال 8

$$\tan \frac{\pi}{8} = 1 \rightarrow \frac{1 - \tan u}{1 + \tan u} = \tan \left(\frac{\pi}{8} - u \right)$$

$$\tan \left(\frac{\pi}{8} - u \right) = \tan u \rightarrow \frac{\pi}{8} - u = k\pi + \pi$$

$$-u = k\pi - \frac{\pi}{8} \xrightarrow{-k\pi = k\pi} u = k\pi + \frac{\pi}{8}$$

$$u = \frac{k\pi}{8} + \frac{\pi}{8}$$