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الف) $\cos^2 u = \sin^2 u - 1 \Rightarrow \cos^2 u - \sin^2 u = -1$

$1 - \sin^2 u = \sin^2 u - 1 \Rightarrow 1 - \sin^2 u = \sin^2 u - 1 \Rightarrow 2 = 2\sin^2 u \Rightarrow \sin^2 u = 1 \Rightarrow \sin u = \pm 1$

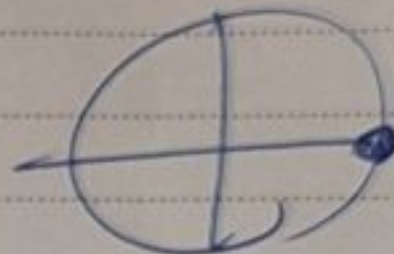
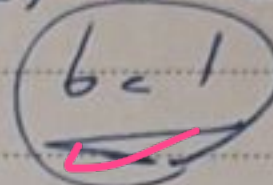


$\sin u = 1 \Rightarrow u = k\pi + \frac{\pi}{2}$
 $\sin u = -1 \Rightarrow u = k\pi + \frac{3\pi}{2}$

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ب) $\cos^2 u + \cos^2 u = 1 \Rightarrow 2\cos^2 u = 1 \Rightarrow \cos^2 u = \frac{1}{2} \Rightarrow \cos u = \pm \frac{1}{\sqrt{2}}$

$\cos u = \frac{1}{\sqrt{2}} \Rightarrow u = k\pi + \frac{\pi}{4}$
 $\cos u = -\frac{1}{\sqrt{2}} \Rightarrow u = k\pi + \frac{3\pi}{4}$



$\cos u = \cos v \Rightarrow u = v$

الف) $\sin^2 u - \cos^2 u = \sin^2 v$

$(\sin^2 u - \cos^2 u) = \sin^2 v$

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$\Rightarrow -\cos^2 u = \sin^2 v$

$\cos^2 u = 0 \Rightarrow u = k\pi + \frac{\pi}{2}$
 $\sin^2 v = -1 \Rightarrow v = k\pi + \frac{3\pi}{2}$

ب) $\cos^2 u + \sin^2 u = 1 \Rightarrow \cos^2 u = 1 - \sin^2 u$

$\Rightarrow u = k\pi + \frac{\pi}{2} - v$

$u = k\pi + \frac{\pi}{2} - v \Rightarrow u = k\pi + \frac{\pi}{2} - v$

الف) $\cos^2 u + \cos^2 u = 1 \Rightarrow 2\cos^2 u = 1$

$\Rightarrow \cos^2 u = \frac{1}{2} \Rightarrow \cos u = \pm \frac{1}{\sqrt{2}}$

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$\cos^2 u = 1 \Rightarrow u = k\pi$
 $\cos^2 u = \frac{1}{2} \Rightarrow u = k\pi + \frac{\pi}{4}$

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روز بیماری های خاص و صعب العلاج

آنها را با $\cos u = 0$ است و عبارت تقریب نشده مرشد
پس جواب غیر قابل قبول مصوب مرشد

$$\tan n - 1 \rightarrow n = k\pi - \frac{\pi}{4}$$

اردیبهشت ۲۵ | 15 May 2022
یکشنبه ۱۴۴۳ شوال ۱۴

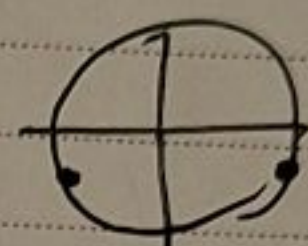
ب) $r \sin^2 m - \sin m \cos m + \cos^2 m = r$ $\Rightarrow r \tan^2 m - \tan m + 1 = \frac{r}{\cos^2 m}$
 $r \tan^2 m - \tan m + 1 = r \tan^2 m \Rightarrow \tan m = -1 \rightarrow \text{Pursi}$

الف) $\cos\left(\frac{x}{2} + m\right) \cos\left(x - \frac{x}{2}\right) = \frac{1}{2}$

$\cos\left(\frac{x}{2} + m\right) = -\sin\left(x - \frac{x}{2}\right)$

$\Rightarrow \frac{r \sin\left(r\alpha - \frac{\pi}{2}\right)}{-r} = \frac{1}{2} \Rightarrow$

$\sin\left(r\alpha - \frac{\pi}{2}\right) = -\frac{1}{r}$



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

ج) $\cos\left(r\alpha - \frac{\pi}{2}\right) = -\sin^2 m \Rightarrow \cos\left(r\alpha - \frac{\pi}{2}\right) = \sin(-r\alpha) \Rightarrow$

$\cos\left(r\alpha - \frac{\pi}{2}\right) = \cos\left(\frac{x}{r} + r\alpha\right) \Rightarrow r\alpha - \frac{\pi}{2} = k\pi \pm \left(\frac{\pi}{r} + r\alpha\right) \rightarrow$

$\alpha = k\pi + \frac{\pi}{r}$

$\frac{\sin^2 m + \sin m}{\sin m} = \sin^2 m + \cos^2 m \Rightarrow \frac{\sin^2 m \cos^2 m + \sin m}{\sin m} = \sin^2 m + \cos^2 m$

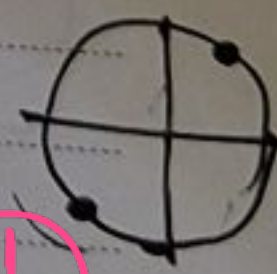
$\frac{\sin^2 m (\cos^2 m + 1)}{\sin m} = 1 \Rightarrow \cos^2 m = 0 \Rightarrow m = k\pi + \frac{\pi}{2} \Rightarrow \alpha = k\pi + \frac{\pi}{2}$

$\frac{\sin \frac{\alpha}{r}}{1 + \cos \frac{\alpha}{r}} = \frac{1 + \cos \frac{\alpha}{r}}{\sin \frac{\alpha}{r}} \Rightarrow \frac{\sin \frac{\alpha}{r}}{1 + \cos \frac{\alpha}{r}} = \frac{1 + \cos \frac{\alpha}{r}}{\sin \frac{\alpha}{r}} \Rightarrow \tan \frac{\alpha}{r} = \cot \frac{\alpha}{r}$

$\alpha = \frac{\pi}{r}$

$\alpha = k\pi + \frac{\pi}{r}$

$\frac{\alpha}{r} = k\pi + \frac{\pi}{r}$



اردیبهشت | ۲۰ | 10 May 2022
سه شنبه | ۹ شوال ۱۴۴۳

$$\cos^2 \alpha - \sin^2 \alpha \cos^2 \beta = 1$$

$$\frac{1 - \cos^2 \beta}{\sin^2 \beta} = -\sin^2 \alpha \cos^2 \beta \quad \begin{cases} \sin^2 \alpha = 0 \Rightarrow \alpha = k\pi \\ -\cos^2 \beta = 1 \Rightarrow \beta = \frac{\pi}{2} + k\pi \Rightarrow \alpha \in \frac{\pi}{2} + k\pi \end{cases}$$

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

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

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

$$\sqrt{1 + \sin^2 \beta} = \sqrt{2} \cos \beta \Rightarrow 1 + \sin^2 \beta = 2 \cos^2 \beta$$

$$1 + \sin^2 \beta = 2(1 - \sin^2 \beta) \Rightarrow 1 - \sin^2 \beta = 1 - \sin^2 \beta \Rightarrow \sin^2 \beta = 0 \Rightarrow \sin \beta = 0 \Rightarrow \beta = k\pi$$

$$\begin{cases} \alpha = \frac{\pi}{4} \\ \alpha = \frac{3\pi}{4} \\ \alpha = \frac{5\pi}{4} \\ \alpha = \frac{7\pi}{4} \end{cases}$$

$$\begin{aligned} b = 1 &\Rightarrow \alpha = k\pi + \frac{\pi}{4} \\ b = -1 &\Rightarrow \alpha = k\pi - \frac{\pi}{4} \\ b = \frac{1}{\sqrt{2}} &\Rightarrow \alpha = k\pi + \frac{\pi}{4} \\ b = -\frac{1}{\sqrt{2}} &\Rightarrow \alpha = k\pi - \frac{\pi}{4} \end{aligned}$$

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

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

$$\sin^2 \alpha - \cos^2 \alpha = -1 \Rightarrow \sin^2 \alpha = 1 - \cos^2 \alpha \Rightarrow \sin^2 \alpha = \sin^2 \alpha$$

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

سوال 4

$$\frac{\sin \frac{\pi}{r}}{1 + \cos \frac{\pi}{r}} = \tan \frac{\pi}{2r}$$

$$\frac{1}{\sin \frac{\pi}{r}} + \cot \frac{\pi}{r} = \frac{1 + \cos \frac{\pi}{r}}{\sin \frac{\pi}{r}} = \frac{1}{\tan \frac{\pi}{2r}} = \cot \frac{\pi}{2r}$$

$$\tan \frac{\pi}{2r} = \cot \frac{\pi}{2r} \rightarrow \tan \frac{\pi}{2r} = \tan \left(\frac{\pi}{r} - \frac{\pi}{2r} \right)$$

$$\frac{\pi}{2r} = k\pi + \frac{\pi}{r} - \frac{\pi}{2r} \rightarrow \frac{\pi}{r} = k\pi + \frac{\pi}{r} \rightarrow n = 2k\pi + \pi$$

جوابها $\rightarrow k=0 \rightarrow n=\pi$

$\rightarrow k=-1 \rightarrow n=-\pi$ $\rightarrow$ اختلاف $= |\pi - (-\pi)| = 2\pi$

سوال 5

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

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

$$\sin u = 0 \rightarrow u = k\pi \rightarrow u = 0, \pi, 2\pi$$

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

مصادم 5 جواب دارد

سوال 9

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

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

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

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

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

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 اشیای است نمی‌دز است

* معادله ۲ جواب دارد