

1R, 1V, 1W

دولت ایستاتی

$$\cos^2 u = 1 - r \sin^2 u \Rightarrow$$

$$1 - r \sin^2 u = \sin^2 u - 1$$

$$4r \sin^2 u + 4 \sin u - r = 0$$

$$\sin^2 u + 4 \sin u - r = 0$$

$$(\sin u + r)(\sin u - 1) = 0$$

$$\frac{-r}{1} = -r \quad \frac{1}{1} = 1$$

$$\sin u = \frac{1}{r} \frac{\pi}{4}$$

$$u = \arcsin \left(\frac{1}{r} \frac{\pi}{4} \right)$$

$$r \cos^2 u - 1 + \cos u - r = 0$$

$$r \cos^2 u + \cos u - r = 0$$

$$\cos^2 u + \cos u - r = 0$$

$$(\cos u + r)(\cos u - r) = 0$$

$$\cos u = 1$$

$$r = 1$$

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

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

$$-\cos^2 u = r \sin^2 u \cos^2 u \Rightarrow \sin^2 u = \frac{1}{r}$$

$$u = \arcsin \left(\frac{1}{r} \frac{\pi}{4} \right)$$

$$u = \arcsin \left(\frac{1}{r} \frac{\pi}{4} \right) \Rightarrow u = \arcsin \left(\frac{1}{r} \frac{\pi}{4} \right)$$

$$r \cos^2 u + r \sin^2 u = 1 \Rightarrow$$

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

$$\sin(\pi + u) = \sin(-u)$$

$$\frac{\pi}{r} - u = \arcsin \left(\frac{1}{r} \frac{\pi}{4} \right) + u \Rightarrow \frac{\pi}{r} = 2u + \arcsin \left(\frac{1}{r} \frac{\pi}{4} \right)$$

$$\frac{\pi}{r} - u = \arcsin \left(\frac{1}{r} \frac{\pi}{4} \right) + u \Rightarrow$$

$$\left(\frac{4\pi}{r} + \frac{\pi}{4} \right)$$

$$\text{حيث } \frac{\cos n}{\sin n} (r \cos n + 1) = \frac{1}{\sin n} \Rightarrow r \cos^2 n + \cos n = 0 \quad - \text{✓}$$

$$\cos n (r \cos n + 1) = 0 \quad (1,0)$$

الفا $\cos n = 0 = k\pi + \frac{\pi}{2} \quad \times$

$$\cos n = \frac{-1}{r} \Rightarrow k\pi + \frac{\pi}{r} \quad \checkmark$$

$$r \sin^2 n - \sin n \cos n + \cos^2 n = r$$

$$r + r \sin^2 n - \sin n \cos n + \cos^2 n$$

$$= r \cos^2 n = r - \cos^2 n - \sin n \cos n$$

$$-\cos n (1 + \sin n) = 0$$

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

$$\cos \left(\frac{\pi}{r} + n \right) \cos \left(n + \frac{\pi}{r} - \frac{\pi}{r} \right) = \frac{1}{\sin \left(n + \frac{\pi}{r} \right)}$$

$$\frac{1}{\sin \left(\frac{\pi}{r} + n \right)} = \frac{1}{\sin \left(\frac{\pi}{r} \right)} \Rightarrow \frac{\pi}{r} + n = k\pi + \frac{\pi}{r}$$

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

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

$$n = k\pi + \frac{\pi}{r} \quad \checkmark$$

$$\rightarrow | \sin \left(\frac{\pi}{r} - \pi + \frac{\pi}{a} \right) | = -\sin \pi$$

cos

$$\frac{\pi}{r} - \pi + \frac{\pi}{a} = -\pi$$

$$\frac{\pi}{r} - \pi + \frac{\pi}{a} = k\pi - \pi \Rightarrow \text{solve}$$

$$\frac{\pi}{r} - \pi + \frac{\pi}{a} = k\pi - \pi + \pi$$

$$\cancel{\frac{\pi}{r}} + \frac{\pi}{a} - \cancel{\pi} - k\pi = \pi$$

$$\frac{-\pi}{a} - k\pi = \pi$$

$$\frac{-\pi}{a} - k\pi = \pi$$

$$\frac{\sin \pi}{\sin \pi} | \cos \pi + 1 |$$

$$\Rightarrow \cos \pi + 1 = \frac{\sin \pi}{\cos \pi}$$

$$\cos \pi = 0$$

$$\cos \pi = 0 \Rightarrow$$

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

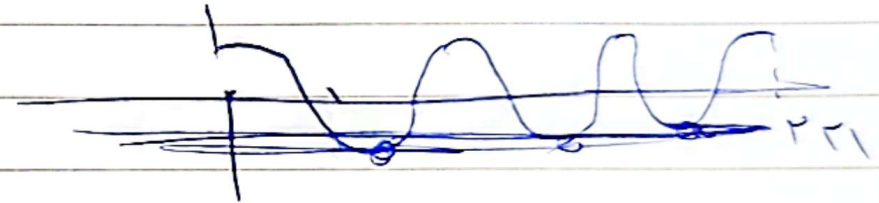
$$\cos^2 u - 1 - \sin^2 u \cos^2 u = 0$$

$$- \sin^2 u - \sin^2 u \cos^2 u = 0$$

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

let $\frac{u}{2} = \theta$

$$\cos^2 u = -1 \Rightarrow$$



4 جواب دارد

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$$1 + \sin^2 \psi_n = r^2 \cos^2 \psi_n \Rightarrow \sin^2 \psi_n = r^2 \cos^2 \psi_n - 1$$

$$\sin^2 \psi_n = r^2 \cos^2 \psi_n - 1 \quad \text{و}$$

$$\Rightarrow \sin^2 \psi_n + \cos^2 \psi_n$$

میدارد جواب ها!

$$\sin^2 \psi_n = \cos^2 \psi_n \Rightarrow$$

$$\cos(\frac{\pi}{2} - \psi_n) \Rightarrow$$

$$\psi_n = k\pi - \frac{\pi}{2} + \pi$$

$$\psi_n = k\pi - \frac{\pi}{2} \Rightarrow$$

$$n = k\pi - \pi$$

✓

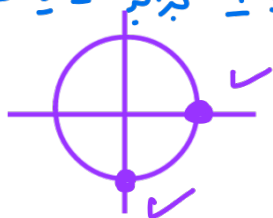
$$\psi_n = k\pi + \frac{\pi}{2} - \pi$$

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

$$\frac{k\pi + \pi}{4}$$

در سوالات به فرم $\pm \sin^n x \pm \cos^n x$ برابر 1 یا -1. فقط کافی است نقاط را مشخص کنید!
چک کنی!

$$\sin^n x - \cos^n x = 1$$



$$x = 2\pi \frac{p}{q}$$

$$x = \frac{2\pi p}{q}$$

$$\text{اگر } (\sin^2 x + \cos^2 x)(\sin^2 x - \cos^2 x) = 1 \Rightarrow$$

$$-\cos^2 x = 1 \Rightarrow$$

$$\cos^2 x = -1 \Rightarrow \frac{2k\pi + \pi}{2} = \frac{2l\pi + \pi}{2}$$

$$\sin^2 x - \cos^2 x = -1$$

تنها نقاطی را مورد بررسی قرار می دهیم

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

$$\Rightarrow 2k\pi \cup 2k\pi - \frac{\pi}{2}$$

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

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

$$\cos x = 0 \rightarrow x = k\pi + \frac{\pi}{2}$$

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

سوال ۳ - ب

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

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

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

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

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

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

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

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

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

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

مقادیر 5 جواب دارد

سوال ۸

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

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

$$-\varphi = k\pi - \frac{\pi}{\varepsilon} \xrightarrow{-k\pi = k\pi} \varphi = k\pi + \frac{\pi}{\varepsilon}$$

$$\boxed{\varphi = \frac{k\pi}{\varepsilon} + \frac{\pi}{4}}$$

سوال ۹

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

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

$$\sin \varphi = -1 \rightarrow \varphi = k\pi - \frac{\pi}{2} \xrightarrow[\substack{0 \leq \varphi \leq \pi \\ k \in \mathbb{Z}}]{\text{✓}} \varphi = \frac{3\pi}{2}$$

$$\hookrightarrow \sin \varphi = \frac{1}{2}$$

$$\sin \varphi = \frac{1}{2} \rightarrow \varphi = k\pi + \frac{\pi}{6} \text{ یا } \varphi = k\pi + \frac{5\pi}{6} \xrightarrow[\substack{0 \leq \varphi \leq \pi \\ k \in \mathbb{Z}}]{\text{✓}} \varphi = \frac{\pi}{6} \text{ یا } \frac{5\pi}{6}$$

چون عبارت به توان ۲ رسیده است جواب زاویه تولید می کنند
به ازای $\varphi = \frac{5\pi}{12}$ $\cos \varphi$ منفی می شود پس چون جواب را اشیاءات می خواهیم

✱ معادله ۲ جواب دارد