

$$1 \cos 2\alpha - \tan^2 \alpha = 1$$

$$\alpha \in [0, 2\pi]$$

$$1 \cos 2\alpha = 1 + \tan^2 \alpha$$

$$1 \cos 2\alpha = \frac{1}{\cos^2 \alpha} \Rightarrow \cos^2 \alpha = \frac{1}{1} \Rightarrow \cos \alpha = \frac{1}{1} \Rightarrow$$



$$\alpha = \frac{\pi}{3}$$

$$\alpha = -\frac{\pi}{3}$$

در جواب

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

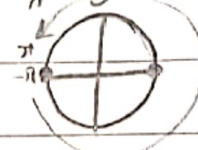
$$\alpha \in [-\pi, \pi]$$

$$2 \sin^2 \alpha + 2 \cos 2\alpha + 2 = 0$$

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

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

$$\cos^2 \alpha = 0 \Rightarrow \cos \alpha = 0 \Rightarrow \alpha = \frac{\pi}{2} + k\pi$$



در جواب

$$2 \sin(\alpha) \cos(2\alpha) + \sin(\alpha) = 1$$

$$\alpha \in [0, 2\pi]$$

$$\sin(\alpha) (2 \cos 2\alpha + 1) = 1$$

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

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

$$\sin(\alpha) (2 (1 - \sin^2 \alpha) - 1) = 1$$

$$\sin(\alpha) (2 - 2 \sin^2 \alpha) = 1$$

$$2 \sin \alpha - 2 \sin^3 \alpha = 1$$

$$\sin^3 \alpha = 1$$



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

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

در جواب

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$$\frac{\pi}{2} + \frac{0\pi}{2} + \frac{4\pi}{2} = \frac{5\pi}{2}$$

$$\frac{1}{\sin\left(\frac{\pi + \pi a}{r}\right)} + \frac{1}{\cos\left(\frac{\pi + \pi a}{r}\right)} = 0 \quad a \in [0, \pi] \quad \text{افلا جواب لا}$$

$$\frac{1}{\sin\left(\frac{\pi}{r} + \pi a\right)} + \frac{1}{\cos\left(\frac{\pi}{r} + \pi a\right)} = 0 \quad \tan \pi a = ?$$

$$\frac{1}{\cos \pi a} + \frac{1}{\sin \pi a} = 0 \quad \begin{aligned} * \cos \pi a &\neq 0 \\ \pi a &\neq k\pi + \frac{\pi}{2} \\ a &\neq \frac{k\pi}{r} + \frac{\pi}{2r} \end{aligned}$$

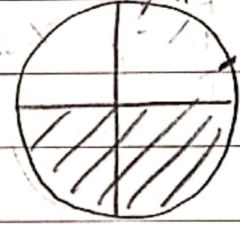
$$\frac{\sin \pi a - \cos \pi a}{\sin \pi a \cos \pi a} = 0 \quad \begin{aligned} * \sin \pi a &\neq 0 \\ \pi a &\neq k\pi \rightarrow a \neq \frac{k\pi}{r} \end{aligned}$$

$$r \sin \pi a \cos \pi a - \cos \pi a = 0$$

$$\cos \pi a (r \sin \pi a - 1) = 0$$

$$\rightarrow \cos \pi a = 0 \quad \begin{aligned} \pi a &= k\pi + \frac{\pi}{2} \Rightarrow a = \frac{k\pi}{r} + \frac{\pi}{2r} \quad * \end{aligned}$$

$$\rightarrow \sin \pi a = 1 \quad \begin{aligned} \pi a &= k\pi + \frac{\pi}{2} \\ a &= k\pi + \frac{\pi}{2r} \end{aligned}$$



$$a = \frac{2\pi}{1r} - \frac{\pi}{1r} = \frac{\pi}{1r} = \frac{\pi}{r}$$

$$\Rightarrow \tan \pi a = \tan \frac{\pi}{r} = \sqrt{r-1}$$

$$m(\cos a - \sin a) - r\sqrt{r} \sin(\pi a) = \sqrt{r}$$

$$* (\cos a - \sin a)^2 = 1 - r \sin a \cos a = 1 - \sin \pi a \quad \text{--- 2}$$

$$\sin \pi a = 1 - (\cos a - \sin a)^2$$

$$\sin \pi a = 1 - \frac{r}{r} = \frac{1}{r}$$

$$m\sqrt{\frac{r}{r}} - r\sqrt{r} \times \frac{1}{r} = \sqrt{r} \Rightarrow$$

$$m\sqrt{\frac{r}{r}} - \sqrt{r} = \sqrt{r} \Rightarrow m\sqrt{\frac{r}{r}} = 2\sqrt{r}$$

$$m = \frac{2\sqrt{r}}{\sqrt{\frac{r}{r}}} = 2\sqrt{r} \times \sqrt{\frac{r}{r}} = 2 \times \sqrt{r} = \sqrt{r}$$

$$* \cos\left(a + \frac{\pi}{r}\right) = \frac{1}{\sqrt{r}}$$

$$\cos a \cos \frac{\pi}{r} - \sin a \sin \frac{\pi}{r} = \frac{1}{\sqrt{r} m} = ?$$

$$\frac{\cos a - \sin a}{\sqrt{r}} = \frac{1}{\sqrt{r}} \Rightarrow$$

$$\cos a - \sin a = \frac{\sqrt{r}}{\sqrt{r}}$$

$$\cos a - \sin a = \frac{r}{r}$$

$$\Rightarrow m = \sqrt{r}$$

$$\sin\left(\alpha + \frac{\pi}{4}\right) \cos\left(\alpha - \frac{\pi}{4}\right) = 1 \quad \alpha \in [0, 2\pi] \quad \text{٦}$$

$$\cos\left(\alpha - \frac{\pi}{4}\right) = \sin\left(\frac{\pi}{4} + \left(\alpha - \frac{\pi}{4}\right)\right) = \sin\left(\alpha + \frac{\pi}{4} - \frac{\pi}{4}\right) = \sin\left(\alpha + \frac{\pi}{4}\right)$$

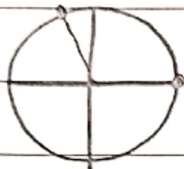
$$\sin\left(\alpha + \frac{\pi}{4}\right) = 1 \Rightarrow \sin\left(\alpha + \frac{\pi}{4}\right) = \frac{1}{1} \sin \frac{\pi}{4}$$



$$\alpha + \frac{\pi}{4} = 2k\pi + \frac{\pi}{4} \quad \alpha + \frac{\pi}{4} = 2k\pi + \frac{5\pi}{4}$$

$$\alpha = 2k\pi$$

$$\alpha = 2k\pi + \frac{3\pi}{2}$$



جواب

٧ - مجموع جواب ها :

$$\sin \alpha + \sqrt{3} \cos \alpha = \sqrt{2}$$

$$\alpha \in [-\pi, 2\pi]$$

$$\sin \alpha + \frac{\sin \frac{\pi}{6}}{\cos \frac{\pi}{6}} \cos \alpha = \sqrt{2}$$

$$\frac{-12\pi}{12}$$

$$\frac{12\pi}{12}$$

$$\cos \frac{\pi}{6} \sin \alpha + \sin \frac{\pi}{6} \cos \alpha = \cos \frac{\pi}{6} \times \sqrt{2}$$

$$\sin\left(\alpha + \frac{\pi}{6}\right) = \frac{1}{\sqrt{2}} \sin \frac{\pi}{6}$$

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

$$\alpha + \frac{\pi}{6} = 2k\pi + \pi - \frac{\pi}{6} \rightarrow \alpha = 2k\pi + \frac{5\pi}{12}$$

مجموع جواب ها :

k	-1	0	1	
α	X	$-\frac{\pi}{12}$	$\frac{11\pi}{12}$	$\frac{11\pi}{12} + \frac{5\pi}{12} - \frac{\pi}{12} = \frac{15\pi}{12}$
	X	$\frac{5\pi}{12}$	X	

$$r \sin \alpha \sin \left(\frac{r\pi}{r} - \alpha \right) = 1 \quad \text{المجموع جواب كما} \quad \alpha \in \left[0, \frac{r\pi}{r} \right]$$

$-\cos \alpha$

$$-r \sin \alpha \cos \alpha = 1 \Rightarrow \frac{1}{r} \sin r\alpha = \frac{-1}{r}$$

$$\sin r\alpha = \frac{-1}{r} \Rightarrow \left. \begin{aligned} r\alpha &= rK\pi - \frac{\pi}{r} \Rightarrow \alpha = K\pi - \frac{\pi}{r} \\ r\alpha &= rK\pi + \frac{V\pi}{r} \Rightarrow \alpha = K\pi + \frac{V\pi}{r} \end{aligned} \right\}$$



K	0	1	r
α	$\frac{\pi}{r}$	$\frac{11\pi}{r}$	$\frac{r\pi}{r}$
	$\frac{V\pi}{r}$	$\frac{19\pi}{r}$	X

المجموع جواب كما: $\frac{11\pi}{r} + \frac{r\pi}{r} + \frac{V\pi}{r} + \frac{19\pi}{r} = 2\pi$

$$\frac{(1 + \cos r\alpha)}{r \cos^r \alpha} \frac{(1 + \cos r\alpha)}{r \cos^r \alpha} \frac{(1 + \cos r\alpha)}{r \cos^r \alpha} = \frac{1}{\lambda}$$

$$\frac{1}{\frac{1}{r} \sin^r \alpha} \cos^r \alpha \cos^r \alpha \cos^r \alpha = \frac{1}{\lambda}$$

$$\sin^r \alpha \neq 0$$

$$\sin \alpha \neq 0$$

$$\alpha \neq K\pi$$

$$\sin^r \alpha \cos^r \alpha \cos^r \alpha \cos^r \alpha = \frac{1}{\lambda r}$$

$$\Rightarrow \frac{1}{\cancel{r}} \frac{\sin^r \alpha}{\sin^r \alpha} = \frac{1}{\cancel{r}} \Rightarrow \sin^r \alpha = \sin^r \alpha$$

$$\sin \lambda \alpha = \sin \alpha$$

$$\sin \lambda \alpha = \sin (-\alpha)$$

$$\rightarrow \lambda \alpha = rK\pi + \alpha \rightarrow \alpha = \frac{rK\pi}{r}$$

$$\rightarrow \lambda \alpha = rK\pi + \pi - \alpha \rightarrow \alpha = \frac{rK\pi}{r} + \frac{\pi}{r}$$

$$\rightarrow \lambda \alpha = rK\pi - \alpha \rightarrow \alpha = \frac{rK\pi}{r}$$

$$\rightarrow \lambda \alpha = rK\pi + \pi + \alpha \rightarrow \alpha = \frac{rK\pi}{r} + \frac{\pi}{r}$$

$$\Rightarrow \max A = \left\{ \frac{\lambda \pi}{r} \right\}$$

$$\tan(\pi - \alpha) \tan(\alpha) = 1$$

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

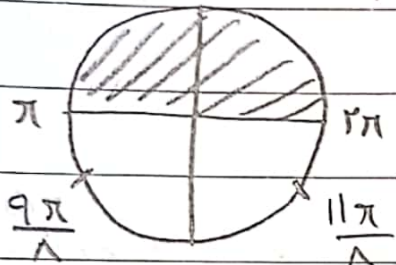
$$\tan \pi - \alpha = \cot \alpha$$

$$\tan \pi - \alpha = \tan\left(\frac{\pi}{2} - \alpha\right)$$

١. مجموع جواب ها :

$$[\pi, 2\pi] \quad 1/0$$

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



مجموع جواب ها :

$$\frac{9\pi}{4} + \frac{11\pi}{4} = \frac{20\pi}{4} = 5\pi$$

$$\tan \pi - \alpha = \frac{1}{\tan \alpha} = \cot \alpha \rightarrow \tan \pi - \alpha = \tan\left(\frac{\pi}{2} - \alpha\right)$$

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

k	F	a	Y	V
n	$\frac{9\pi}{4}$	$\frac{11\pi}{4}$	$\frac{13\pi}{4}$	$\frac{15\pi}{4}$

$$S = \left(\frac{9+11+13+15}{4}\right)\pi = \frac{48\pi}{4} = 12\pi$$