

$$\tan^2 + 1 = \sec^2 \Rightarrow \frac{1}{\cos^2} = \sec^2$$

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

$$m = 2K\pi \pm \frac{\pi}{2} \quad \frac{\pi}{2}, -\frac{\pi}{2} \quad \text{جواب ۲}$$

$$-2 \leq 2\cos 3\alpha \leq 2 \quad \sin^2 \alpha \geq 0 \quad \sin = 0 \Rightarrow \alpha = K\pi \quad 2\cos 4\alpha = -2$$

$$\cos 4\alpha = -1 \Rightarrow 4\alpha = 2K\pi + \pi \Rightarrow \alpha = \frac{2K\pi}{4} + \frac{\pi}{4}$$

جواب ۲: $[-\pi, \pi]$ دارد

$$\sin(2\cos 4\alpha + 1) = 2\sin^2 + \cos 4\alpha$$

$$2\sin \cos 4\alpha + \sin \alpha - 2\sin^2 - \cos 4\alpha = 0$$

$$\cos 4\alpha (2\sin - 1) = 2\sin^2 - \sin \Rightarrow \cos 4\alpha = \frac{2\sin - \sin}{2\sin - 1} = \sin \alpha$$

$$\sin \alpha = \frac{1}{2} \Rightarrow \alpha = \frac{\pi}{6}, \frac{5\pi}{6} \quad \cos 4\alpha = \sin \alpha = \cos(\frac{\pi}{6} - \alpha)$$

$$4\alpha = 2K\pi + \frac{\pi}{6} - \alpha \Rightarrow \alpha = \frac{2K\pi}{5} + \frac{\pi}{6} \Rightarrow \frac{5\pi}{6}$$

$$\frac{1}{\cos 4\alpha} + \frac{1}{-\sin 4\alpha} = 0 \quad \cos 4\alpha, \sin 4\alpha \neq 0$$

$$\frac{1}{\cos 4\alpha} = \frac{1}{\sin 4\alpha} \Rightarrow \cos 4\alpha = \sin 4\alpha \Rightarrow \cos 4\alpha = 2\sin 4\alpha \cos 4\alpha$$

$$4\alpha = 2K\pi + \frac{\pi}{6} \Rightarrow \alpha = K\pi + \frac{\pi}{12}$$

$$\Rightarrow \sin 4\alpha = \frac{1}{2} \quad 4\alpha = 2K\pi + \frac{5\pi}{6} \Rightarrow \alpha = K\pi + \frac{5\pi}{12}$$

$$\cos 4\alpha \neq 0 \quad \frac{5\pi}{12} - \frac{\pi}{12} = \frac{\pi}{3} \quad \cos(\frac{2\pi}{3}) = -\frac{1}{2}$$

$$\cos \alpha \cos \frac{\pi}{6} - \sin \alpha \sin \frac{\pi}{6} = \frac{1}{\sqrt{3}} \Rightarrow \cos - \sin = \frac{1}{\sqrt{3}}$$

$$(\cos - \sin)^2 = \frac{1}{3} = \frac{1}{3} \Rightarrow \cos^2 + \sin^2 - 2\sin \cos = \frac{1}{3} \Rightarrow \sin 4\alpha = \frac{1}{3}$$

$$m \frac{1}{\sqrt{3}} = \sqrt{\frac{1}{3}} \times \frac{1}{\sqrt{3}} + \sqrt{\frac{1}{3}} \quad m = 4$$

$$4\alpha = 2K\pi - \frac{\pi}{6} + m \Rightarrow \alpha = 2K\pi - \frac{\pi}{6} \rightarrow \frac{11\pi}{6}$$

$$\text{مجموع: } \pi + \frac{11\pi}{6} = \frac{17\pi}{6}$$

ادامه سوال ۳:

$$\sin\left(n + \frac{\pi}{2}\right) \cos\left(\frac{\pi}{2} - n\right) = 1 \quad \sin^2\left(n + \frac{\pi}{2}\right) = 1$$

$$\sin\left(n + \frac{\pi}{2}\right) = \pm 1$$

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

$$n = \frac{\pi}{2}, \frac{5\pi}{2}$$

✓ جواب

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$$\frac{11}{1} \sqrt{17} \sin(n + \alpha) = \sqrt{17} \quad \tan \alpha = \sqrt{17} \quad \alpha = \frac{\pi}{2}$$

$$\sin\left(n + \frac{\pi}{2}\right) = \frac{\sqrt{17}}{17}$$

$$n + \frac{\pi}{2} = 2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2}$$

$$n + \frac{\pi}{2} = \frac{2\pi}{2}, \frac{9\pi}{2}$$

$$n = \frac{11\pi}{17}, \frac{13\pi}{17}, -\frac{\pi}{17}, \frac{2\pi}{17}$$

$$\text{مجموع} = \frac{4\pi}{17}$$

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$$\sin n - \cos n = \frac{1}{\sqrt{2}} \quad -\frac{1}{\sqrt{2}} \sin 2n = \frac{1}{\sqrt{2}}$$

$$\sin 2n = -\frac{1}{\sqrt{2}} \quad 2n = \frac{5\pi}{6}, \frac{11\pi}{6}$$

$$n = \frac{5\pi}{12}, \frac{11\pi}{12}$$

$$\text{مجموع} = \frac{18\pi}{12} = \frac{3\pi}{2}$$

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$$4 \cos^2 \alpha + 4 \cos^2 \beta + 4 \cos^2 \gamma = \frac{1}{\lambda} \Rightarrow \cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma = \frac{1}{4\lambda}$$

$$\frac{\sin \alpha}{\sin \alpha} \times \cos \alpha \cos \beta \cos \gamma = \frac{\pm 1}{\lambda} \Rightarrow \frac{\frac{1}{4} \sin 2\alpha \cos 2\beta \cos 2\gamma}{\sin \alpha} = \frac{\pm 1}{\lambda}$$

$$\frac{\frac{1}{4} \sin 2\alpha \cos 2\beta \cos 2\gamma}{\sin \alpha} = \frac{\pm 1}{\lambda} \Rightarrow \frac{1}{\lambda} \frac{\sin 2\alpha}{\sin \alpha} = \frac{\pm 1}{\lambda} \Rightarrow \frac{\sin 2\alpha}{\sin \alpha} = \pm 1$$

$$\sin 2\alpha = \sin \alpha \quad \sin 2\alpha = -\sin \alpha = \sin(-\alpha) \quad \text{ادامه یابید صغی}$$

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

$$2n = k\pi + \frac{\pi}{2} - n \Rightarrow \alpha = \frac{k\pi}{3} + \frac{\pi}{6}$$

$$\text{داده: } n = \frac{11\pi}{12}, \frac{13\pi}{12}, \frac{9\pi}{12}, \frac{15\pi}{12}$$

$$\text{مجموع} = 4\pi$$

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$$n = \frac{2k\pi}{5}, \frac{2k\pi}{5} + \frac{\pi}{5}, \frac{2k\pi}{5}, \frac{2k\pi}{5} + \frac{\pi}{5}$$

$$\frac{2\pi}{5}, \frac{4\pi}{5}, \frac{4\pi}{5}, \frac{12\pi}{5}, \frac{4\pi}{5}, \frac{2\pi}{5}, \frac{6\pi}{5}$$

ادامه سوال 9

⑦ عبارت را $\frac{1}{r}$ ضرب می‌کنیم.

$$\frac{1}{r} \sin u + \frac{\sqrt{r}}{r} \cos u = \frac{\sqrt{r}}{r}$$

$$\cos u \cdot \sin u + \sin u \cdot \cos u = \sqrt{\frac{r}{r}} \rightarrow \sin(u + \frac{\pi}{2}) = \sqrt{\frac{r}{r}}$$

$$\int u + \frac{\pi}{r} = 2k\pi + \frac{\pi}{2} \rightarrow u = 2k\pi - \frac{\pi}{1r} \xrightarrow{-\pi \leq u \leq \pi} k=0,1 \rightarrow u = -\frac{\pi}{1r}, \frac{19\pi}{1r}$$

$$\left\{ u + \frac{\pi}{r} = 2k\pi + \frac{\pi}{2} \rightarrow u = 2k\pi + \frac{\pi}{1r} \xrightarrow{-\pi \leq u \leq \pi} k=0 \rightarrow u = \frac{\pi}{1r} \right.$$

$$S = \frac{19\pi}{1r} - \frac{\pi}{1r} + \frac{\pi}{1r} = \frac{19\pi}{1r} = \boxed{\frac{19\pi}{r}}$$

$$\sin(\frac{19\pi}{r} - u) = -\cos u$$

⑧

$$r \sin u (-\cos u) \geq 1 \rightarrow -r(\sin u \cos u) \geq 1 \rightarrow \sin 2u \leq -\frac{1}{r}$$

$$2u = 2k\pi - \frac{\pi}{r} \leq 2k\pi + \frac{19\pi}{r} \rightarrow u = k\pi - \frac{\pi}{2r} \leq k\pi + \frac{19\pi}{2r}$$

$$\xrightarrow{0 \leq u \leq 2\pi} \begin{cases} 1 \\ 2 \end{cases} \begin{cases} k=0,1 \rightarrow u = \frac{19\pi}{2r}, \frac{19\pi}{1r} \\ k=1,2 \rightarrow u = \frac{11\pi}{1r}, \frac{15\pi}{1r} \end{cases}$$

$$S = \frac{19\pi}{1r} + \frac{19\pi}{1r} + \frac{11\pi}{1r} + \frac{15\pi}{1r} = \frac{64\pi}{1r} = \boxed{64\pi}$$