

$$\sin x \cdot (\sqrt{\cos^2 x + 1}) = 1$$

-۳

$$\rightarrow (\sin x)(\sqrt{1 - \sin^2 x}) = 1$$

$$\sin x = t \rightarrow t(\sqrt{1 - t^2}) = 1 \rightarrow -t^2 + t - 1 = 0$$

$$\xrightarrow{t=-1} (t+1)(\sqrt{t^2 - t + 1}) = 0$$

$t = -1 \quad t = \frac{1}{\sqrt{2}}$

$$\textcircled{1} \sin x = -1 \rightarrow x = \frac{3\pi}{2}$$

$$\textcircled{2} \sin x = \frac{1}{\sqrt{2}} \rightarrow x = \frac{\pi}{4}, x = \frac{5\pi}{4}$$

$$\text{جواب} = \frac{3\pi}{2} + \frac{\pi}{4} + \frac{5\pi}{4} = \frac{9\pi}{2}$$

$$\frac{1}{\sin(\frac{\pi}{4} + x)} + \frac{1}{\cos(\frac{\pi}{4} + x)} = 0$$

-۴

$$\rightarrow \frac{1}{\cos^2 x} - \frac{1}{\sin^2 x} = 0 \Rightarrow \frac{1}{\cos^2 x} = \frac{1}{\sin^2 x}$$

$$\rightarrow \cos^2 x = \sin^2 x \xrightarrow{\div \cos^2 x} \tan^2 x = 1$$

$$\rightarrow \sin^2 x = \frac{1}{2} \begin{cases} x = 2k\pi + \frac{\pi}{4} \rightarrow x = k\pi + \frac{\pi}{4} \\ x = 2k\pi + \frac{3\pi}{4} \rightarrow x = k\pi + \frac{3\pi}{4} \end{cases}$$

$$\rightarrow \alpha = \frac{5\pi}{12} - \frac{\pi}{12} = \frac{\pi}{6} \rightarrow \tan \alpha = \tan \frac{\pi}{6} = \frac{1}{\sqrt{3}}$$

$$\cos(x + \frac{\pi}{4}) = \cos x \cdot \cos \frac{\pi}{4} - \sin x \cdot \sin \frac{\pi}{4}$$

$$\xrightarrow{\cos \frac{\pi}{4} = \sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}} \frac{\sqrt{2}}{2} (\cos x - \sin x) = \frac{1}{\sqrt{2}}$$

$$\times \frac{\sqrt{2}}{2} \rightarrow \cos x - \sin x = \frac{1}{2}$$

$$(\cos x - \sin x)^2 = 1 - \sin^2 x \rightarrow \frac{1}{4} = 1 - \sin^2 x \rightarrow \sin^2 x = \frac{3}{4}$$

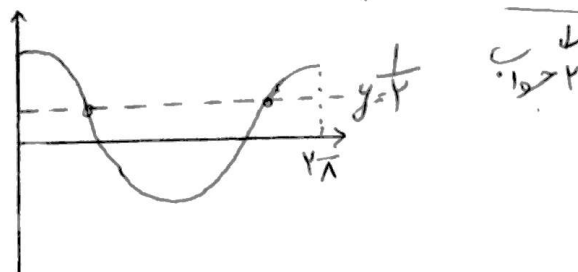
$$\rightarrow m(\frac{1}{\sqrt{4}}) - \sqrt{4} = \sqrt{4} \Rightarrow m = 4$$

دوازدهم / ۱۳۹۸

$$\lambda \cos x = 1 + \tan^2 x \Rightarrow \lambda \cos x = \frac{1}{\cos^2 x} \quad -1$$

$$\rightarrow \lambda \cos^3 x = 1 \rightarrow \cos^3 x = \frac{1}{\lambda}$$

$$\rightarrow \cos x = \frac{1}{\sqrt[3]{\lambda}} = \cos \frac{\pi}{3} \rightarrow x = 2k\pi \pm \frac{\pi}{3}$$



$$\sin^2 x = \frac{1 - \cos^2 x}{2} \Rightarrow \frac{d}{dx} \sin^2 x = \frac{d}{dx} (1 - \cos^2 x) \quad -۲$$

$$\frac{d}{dx} (1 - \cos^2 x) + 2 \cos^2 x = -2$$

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

$$\rightarrow 2 \cos^2 x - 2 \cos^2 x = -2$$

$$\rightarrow 10 \cos^2 x - 10 \cos^2 x + 12 \cos x = 9$$

$$\rightarrow 12 \cos^2 x - 10 \cos^2 x - 12 \cos x + 12 = 0$$

$$t = \cos x, -1 \leq t \leq 1$$

$$14t^2 - 10t^2 - 12t + 12 = 0 \quad t = -1$$

$$(t+1)(14t^2 - 24t + 12) = 0$$

$\Delta < 0$

$$\Rightarrow t = \cos x = -1 \Rightarrow x = 2k\pi + \pi \rightarrow \textcircled{1}$$

$$(\sqrt{r} \cos^r \alpha)(\sqrt{r} \cos^r \alpha)(\sqrt{r} \cos^r \alpha) = \frac{1}{\lambda} \quad -9$$

$$\frac{x \sin^r \alpha}{\sqrt{r}} \left(\frac{1}{\sqrt{r}} \sin^r \alpha \right) (\sqrt{r} \cos^r \alpha) (\sqrt{r} \cos^r \alpha) = \frac{1}{\lambda} \sin^r \alpha$$

$$\left(\frac{1}{\sqrt{r}} \sin^r \alpha \right) (\sqrt{r} \cos^r \alpha) = \frac{1}{\lambda} \sin^r \alpha$$

$$\Rightarrow \frac{1}{\sqrt{r}} \sin^r \alpha = \frac{1}{\lambda} \sin^r \alpha \Rightarrow \lambda \alpha = K\pi \pm \alpha$$

$$\Rightarrow \begin{cases} V\alpha = K\pi \Rightarrow \alpha = \frac{K\pi}{V} \\ 9\alpha = K\pi \Rightarrow \alpha = \frac{K\pi}{9} \end{cases}$$

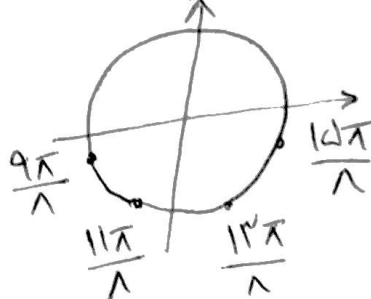
$$A = \left\{ \frac{\pi}{9}, \frac{\pi}{V}, \frac{V\pi}{9}, \frac{V\pi}{V}, \frac{\lambda\pi}{9} \right\}$$

$$\max = \frac{\lambda\pi}{9}$$

$$\tan^r x \cdot \tan x = 1 \Rightarrow \tan^r x = \cot x \quad -10$$

$$\Rightarrow \tan^r x = \tan\left(\frac{\pi}{r} - x\right)$$

$$\Rightarrow r x = \frac{\pi}{r} - x + K\pi \Rightarrow x = \frac{K\pi}{r} + \frac{\pi}{\lambda}$$



$$S = \frac{9\pi + 11\pi + 13\pi}{\lambda} = \frac{V\lambda\pi}{\lambda} = 4\pi$$

$$x - \frac{\pi}{r} = \alpha \rightarrow x + \frac{\pi}{r} = \alpha + \frac{\pi}{r} \quad -9$$

$$\rightarrow \sin\left(\frac{\pi}{r} + \alpha\right) \cdot \cos \alpha = 1 \rightarrow \cos^r \alpha = 1$$

$$\rightarrow \alpha = K\pi \rightarrow x - \frac{\pi}{r} = K\pi \rightarrow x = K\pi + \frac{\pi}{r}$$

$$\frac{1}{11} \sqrt{1 + (\sqrt{r})^r} \sin(x + \alpha) \quad -V$$

$$\hookrightarrow \tan \alpha = \sqrt{r} \Rightarrow \alpha = \frac{\pi}{r}$$

$$\rightarrow \sin x + \sqrt{r} \cos x = r \sin\left(x + \frac{\pi}{r}\right) = \sqrt{r}$$

$$\rightarrow \sin\left(x + \frac{\pi}{r}\right) = \frac{\sqrt{r}}{r} = \sin \frac{\pi}{r}$$

$$\hookrightarrow \begin{cases} x + \frac{\pi}{r} = rK\pi + \frac{\pi}{r} \rightarrow x = rK\pi - \frac{\pi}{r} \\ x + \frac{\pi}{r} = rK\pi + \frac{V\pi}{r} \rightarrow x = rK\pi + \frac{V\pi}{r} \end{cases}$$

$$K=0 \begin{cases} x = -\frac{\pi}{r} \checkmark \\ x = \frac{V\pi}{r} \checkmark \end{cases} \quad K=1 \begin{cases} x = \frac{rV\pi}{r} \checkmark \\ x = \frac{rV\pi}{r} \rightarrow \text{outside} \end{cases}$$

$$K=-1 \begin{cases} x = -\frac{rV\pi}{r} \\ x = -\frac{rV\pi}{r} \end{cases} \rightarrow \text{outside}$$

$$S = \frac{rV\pi + V\pi - \pi}{r} = \frac{rV\pi}{r}$$

$$\sin\left(\frac{r\pi}{r} - x\right) = -\cos x \quad -11$$

$$\rightarrow r \sin x \cos x = -1 \rightarrow r \sin^r x = -1$$

$$\rightarrow \sin^r x = -\frac{1}{r}$$

$$\frac{r\pi}{r} + \pi = \frac{V\pi}{r}$$

$$\hookrightarrow r \times \frac{V\pi}{r} = V\pi$$

