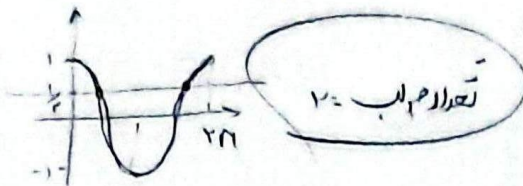


$$1 + \tan^2 \alpha = \sec^2 \alpha \Rightarrow 1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \Rightarrow \cos^2 \alpha = \frac{1}{1 + \tan^2 \alpha} \Rightarrow \cos^2 \alpha = \frac{1}{1 + 1} = \frac{1}{2} \Rightarrow \cos \alpha = \frac{1}{\sqrt{2}}$$

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



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$$\begin{aligned} \sin^2(x) + \cos^2(x) &= 1 \Rightarrow -1 - \sin^2(x) = \cos^2(x) \Rightarrow \cos^2(x) = -1 - \sin^2(x) \\ \cos^2(x) + \sin^2(x) &= 1 \Rightarrow \cos^2(x) = 1 - \sin^2(x) \end{aligned}$$

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

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

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$$\begin{aligned} \cos^2(x) + \sin^2(x) &= 1 \Rightarrow \cos^2(x) = 1 - \sin^2(x) \\ \Rightarrow \frac{\cos^2(x)}{\sin^2(x)} &= \frac{1 - \sin^2(x)}{\sin^2(x)} \Rightarrow \cot^2(x) = \frac{1}{\sin^2(x)} - 1 \end{aligned}$$

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

$$\Rightarrow \left(\frac{\sqrt{r}}{r} \sin n + \frac{1}{r} \cos n \right) / \left(\frac{1}{r} \cos n + \frac{\sqrt{r}}{r} \sin n \right) = 1$$

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$$\frac{1}{r} \sin n + \frac{\sqrt{r}}{r} \cos n = \frac{\sqrt{r}}{r} \Rightarrow \cos \frac{\pi}{2} \sin n + \sin \frac{\pi}{2} \cos n = \frac{\sqrt{r}}{r}$$

$$\Rightarrow \sin \left(n + \frac{\pi}{2} \right) = \sin \frac{\pi}{2} \Rightarrow \begin{cases} n + \frac{\pi}{2} = k\pi + \frac{\pi}{2} \\ n + \frac{\pi}{2} = k\pi + \pi - \frac{\pi}{2} \end{cases} \Rightarrow \begin{cases} n = k\pi \\ n = k\pi + \pi \end{cases}$$

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

$$\Rightarrow -\frac{1}{2} = \sin(n) \Rightarrow \sin(n) = \sin \left(\frac{\pi}{2} \right) \Rightarrow \begin{cases} n = k\pi + \frac{\pi}{2} \\ n = k\pi + \pi - \frac{\pi}{2} \end{cases}$$

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

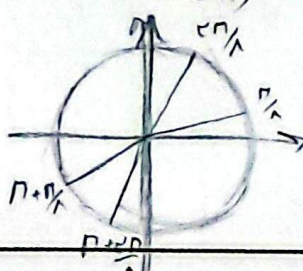
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$$1 = \cos(n) = \cos \left(\frac{\pi}{2} \right) \Rightarrow \cos \left(\frac{\pi}{2} \right) \cos \left(\frac{\pi}{2} \right) \cos \left(\frac{\pi}{2} \right) = \frac{1}{2} \sin \left(\frac{\pi}{2} \right) \Rightarrow \frac{1}{2} \sin \left(\frac{\pi}{2} \right) \cos \left(\frac{\pi}{2} \right) = \frac{1}{2} \sin \left(\frac{\pi}{2} \right)$$

$$\Rightarrow \left(\frac{1}{2} \sin \left(\frac{\pi}{2} \right) \right) \left(\cos \left(\frac{\pi}{2} \right) \right) = \frac{1}{2} \sin \left(\frac{\pi}{2} \right) \Rightarrow \left(\frac{1}{2} \sin \left(\frac{\pi}{2} \right) \right) \left(\cos \left(\frac{\pi}{2} \right) \right) = \frac{1}{2} \sin \left(\frac{\pi}{2} \right)$$

$$\Rightarrow \frac{1}{2} \sin \left(\frac{\pi}{2} \right) = \frac{1}{2} \sin \left(\frac{\pi}{2} \right) \Rightarrow \sin \left(\frac{\pi}{2} \right) = \sin \left(\frac{\pi}{2} \right) \Rightarrow \boxed{\sin \frac{\pi}{2} = \sin \frac{\pi}{2}}$$

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$$\tan(n) = \frac{1}{\tan(\frac{\pi}{n})} \Rightarrow \tan(n) = \cot \left(\frac{\pi}{n} \right) \Rightarrow n = \frac{\pi}{\frac{\pi}{n}} \Rightarrow n = \frac{\pi}{\frac{\pi}{n}}$$


$$\Rightarrow \left(n + \frac{\pi}{n} \right) = \left(n + \frac{\pi}{n} \right) = \frac{\pi}{2}$$

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