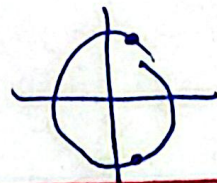


$$1 \cos \alpha = \frac{1 + \tan \alpha}{\frac{1}{\cos \alpha}}$$

$$\rightarrow 1 \cos^2 \alpha = 1 \rightarrow \cos \alpha = \frac{1}{r}$$



مرداب

مرداب ①

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

$$3(1 - \cos^2 \alpha) + \cos^2 \alpha = 0$$

$$\frac{\pi}{2} \rightarrow \frac{3\pi}{2}$$

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

$$r \sin \alpha - r \sin^3 \alpha = 1 \rightarrow \sin^3 \alpha = 1 \rightarrow \frac{\pi}{4}, \frac{5\pi}{4}, \frac{9\pi}{4} \rightarrow \frac{5\pi}{4}$$

$$\frac{1}{\cos \alpha} + \frac{1}{-\sin \alpha} = 0 \rightarrow \cos \alpha = -\sin \alpha$$

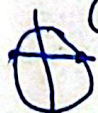
$$\sin \alpha = \sin\left(\frac{\pi}{2} - \alpha\right) \rightarrow \frac{2k\pi + \pi}{4}$$

$$\tan \alpha = \tan \alpha = 1 \rightarrow \tan \alpha = \tan\left(\frac{\pi}{4} - \alpha\right)$$

$$\alpha = k\pi + \frac{\pi}{4} \rightarrow \alpha = \frac{k\pi}{2} + \frac{\pi}{4} \rightarrow \frac{\pi}{4}, \frac{5\pi}{4}, \frac{9\pi}{4}, \frac{13\pi}{4} \rightarrow \frac{5\pi}{4}$$

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

$$\sin\left(\frac{\pi}{4} + \alpha\right) \cos\left(\frac{\pi}{4} - \alpha\right) = 1 \rightarrow \frac{\pi}{4} + \alpha = \frac{\pi}{4} \rightarrow \sin\left(\frac{\pi}{4} + \alpha\right) = \pm 1$$



②