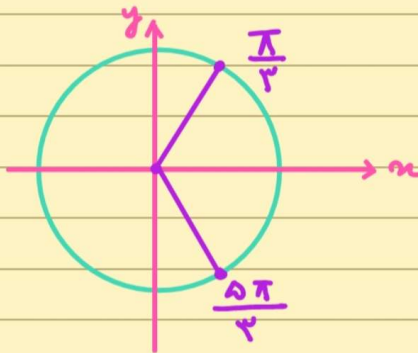


۱-

$$\Delta \cos u - \sin u = 1$$

$$\Delta \cos u = \frac{1}{\cos u} \times \cos u \rightarrow \Delta \cos u = 1 \rightarrow \cos u = \frac{1}{\sqrt{2}} = \cos \frac{\pi}{4}$$

$$\cos u = 2k\pi + \frac{\pi}{4} \xrightarrow{u \in [0, 2\pi]} u = \frac{\pi}{4}, u = 2\pi - \frac{\pi}{4} = \frac{7\pi}{4}$$



۲-

$$\Delta \sin^2 u + 2 \cos^2 u = -2$$

$$\Delta \sin^2 u + 2(\cos^2 u + 1) = \Delta \sin^2 u + 2 \cos^2 \frac{\pi}{4} = 0$$

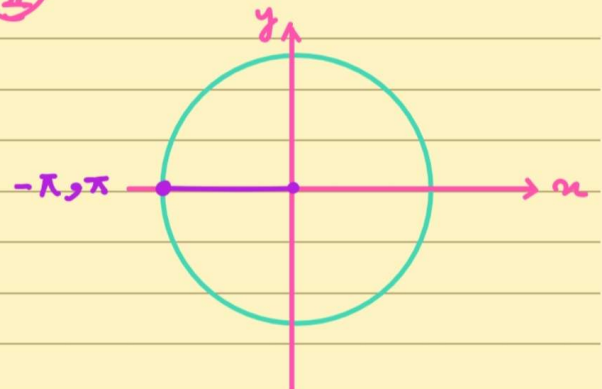
جمع دو عبارت نامتناهی
صفر شده پس ممکن نیست
عبارت برابر با صفر

$$\Delta \sin^2 u = 0 \rightarrow \sin^2 u = 0 \rightarrow \sin u = 0 \rightarrow u \in \{-\pi, 0, \pi\} \text{ (I)}$$

$$2 \cos^2 \frac{\pi}{4} = 0 \rightarrow \cos^2 \frac{\pi}{4} = 0 \rightarrow \frac{\pi}{4} = k\pi + \frac{\pi}{2} = \frac{2k\pi}{2} + \frac{\pi}{2}$$

$$\rightarrow u \in \{-\pi, -\frac{\pi}{2}, \frac{\pi}{2}, \pi\} \text{ (II)}$$

$$I \cap II \rightarrow u \in \{-\pi, \pi\}$$



$$(1 - \sqrt{3} \sin^2 u) \sqrt{3} \sin u \cos(u) + \sin u = 1 \quad \text{۳}$$

$$\sqrt{3} \sin u - \sqrt{3} \sin^3 u + \sin u = 1 \rightarrow \sqrt{3} \sin u - \sqrt{3} \sin^3 u = 1$$

$$u \in [0, 2\pi] \rightarrow \sqrt{3} u = \frac{\pi}{\sqrt{3}} \rightarrow u = \frac{\pi}{3}$$

$$\frac{1}{\sin(\frac{\pi + \pi}{\sqrt{3}})} + \frac{1}{\cos(\frac{\pi + \pi}{\sqrt{3}})} = 0$$

$$\frac{\sin(\frac{\pi}{\sqrt{3}} + \pi)}{\cos \pi} + \frac{\cos(\frac{\pi}{\sqrt{3}} + \pi)}{-\sin \pi} = 0$$

$$\frac{-\sqrt{3} \sin \pi \cos \pi}{\cos \pi \sin \pi} = 0 \rightarrow \cos \pi - \sqrt{3} \sin \pi \cos \pi = 0$$

$$\cos \pi (1 - \sqrt{3} \sin \pi) = 0 \rightarrow \cos \pi = 0 \rightarrow \text{ممنوع است} \alpha$$

$$\downarrow 1 - \sqrt{3} \sin \pi = 0 \rightarrow \sin \pi = \frac{1}{\sqrt{3}}$$

$$u \in [0, \pi], \sqrt{3} u \in \left\{ \frac{\pi}{3}, \frac{5\pi}{3} \right\} \rightarrow u \in \left\{ \frac{\pi}{\sqrt{3}}, \frac{5\pi}{\sqrt{3}} \right\} \rightarrow \alpha = \frac{5\pi}{\sqrt{3}} - \frac{\pi}{\sqrt{3}} = \frac{4\pi}{\sqrt{3}}$$

$$\tan \alpha = \tan \frac{4\pi}{\sqrt{3}} = -\sqrt{3}$$

$$m(\cos u - \sin u) - \sqrt{3} \sqrt{6} \sin u = \sqrt{6}$$

$$\cos(u + \frac{\pi}{6}) = \cos u \cos \frac{\pi}{6} - \sin u \sin \frac{\pi}{6} = \frac{\sqrt{3}}{2} (\cos u - \sin u) = \frac{1}{\sqrt{3}}$$

$$\cos u - \sin u = \frac{\sqrt{3}}{\sqrt{3}}$$

$$(\cos u - \sin u)^2 = \frac{3}{3} = 1 - \sin 2u = \frac{2}{3}$$

اماسى ٥:

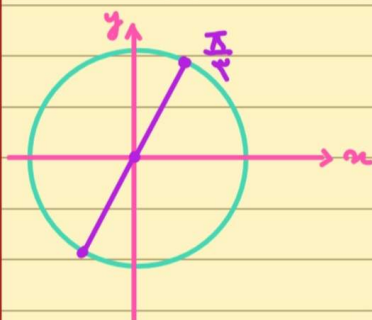
$$\sin 2\pi = \frac{1}{\sqrt{3}}$$

$$\frac{\sqrt{2}}{\sqrt{3}} m - \sqrt{2} \left(\frac{1}{\sqrt{3}} \right) = \sqrt{2} \rightarrow \frac{\sqrt{2}}{\sqrt{3}} m = 2\sqrt{2} \rightarrow m = 6$$

$$\sin\left(u + \frac{\pi}{6}\right) \overset{\sin(u + \frac{\pi}{6})}{\cancel{C_2\left(\frac{\pi}{3} - u\right)}} = 1, \quad \frac{\pi}{3} - u + u + \frac{\pi}{6} = \frac{\pi}{3}$$

$$\sin^2\left(u + \frac{\pi}{6}\right) = 1 \rightarrow \sin\left(u + \frac{\pi}{6}\right) = \pm 1 \xrightarrow{u \in [0, 2\pi]} u + \frac{\pi}{6} = \frac{\pi}{3}, \frac{5\pi}{3}$$

$$u \in \left\{ \frac{\pi}{3}, \frac{5\pi}{3} \right\}$$



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

$$\frac{1}{\sqrt{2}} \sin u + \frac{\sqrt{3}}{\sqrt{2}} \cos u = \frac{\sqrt{2}}{\sqrt{2}} \rightarrow \sin \frac{\pi}{6} \sin u + \cos \frac{\pi}{6} \cos u = \cos \frac{\pi}{6}$$

$$\cos\left(u - \frac{\pi}{6}\right) = \cos \frac{\pi}{6} \rightarrow u - \frac{\pi}{6} = 2k\pi \pm \frac{\pi}{6} \rightarrow u = 2k\pi + \frac{\pi}{3} \quad \text{or} \quad u = 2k\pi - \frac{\pi}{3}$$

$$u \in [-\pi, 2\pi] \rightarrow -\frac{\pi}{3} + \frac{\pi}{3} + 2\pi = 2\pi$$

$$\tan x \tan u = 1$$

$$1 - \tan x \tan u = 0 \rightarrow \tan x = \frac{\tan u + \tan u}{1 - \tan u \tan u} = \pm \infty$$

$$x = K\pi + \frac{\pi}{2} \rightarrow u = \frac{K\pi}{2} + \frac{\pi}{2} \quad x \in [\pi, 2\pi] \rightarrow x \in \left\{ \frac{9\pi}{2}, \frac{11\pi}{2}, \frac{13\pi}{2}, \frac{15\pi}{2} \right\}$$

$$\frac{9\pi}{2} + \frac{11\pi}{2} + \frac{13\pi}{2} + \frac{15\pi}{2} = 6\pi$$

