

دایره دایره A ۱, ۲, ۹

معماریه

$$\text{الف) } \cos^2 u = 2 \sin u - 1 \Rightarrow \frac{\cos^2 u - \sin^2 u}{1 - \sin^2 u} = 2 \sin u - 1 \Rightarrow 2 \sin^2 u + 3 \sin u - 2 = 0 \quad (1)$$

$$\Rightarrow 2t^2 + 3t - 2 = 0 \Rightarrow t = \frac{-3 \pm \sqrt{9 + 16}}{4} \Rightarrow t = \frac{1}{2}, t = -2$$

$\sin u = t$ $\checkmark$ $\checkmark$

$$\Rightarrow \sin u = \frac{1}{2} \Rightarrow u = \left\{ 2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right\}$$

$$\text{ب) } \cos^2 u + \cos u - 2 = 0 \Rightarrow \frac{\cos^2 u - \sin^2 u}{1 - \sin^2 u} + \cos u - 2 = 0 \Rightarrow$$

$$2 \cos^2 u + \cos u - 2 = 0 \Rightarrow 2t^2 + t - 2 = 0 \Rightarrow t = \frac{-1 \pm \sqrt{1 + 16}}{4}$$

$\cos u = t$ $\checkmark$ $\checkmark$

$$\Rightarrow t = 1, t = -\frac{2}{1} = -2$$

$\checkmark$ $\checkmark$

$$\Rightarrow \cos u = 1 \Rightarrow u = \{2k\pi\}$$

$$\text{الف) } \sin^2 u - \cos^2 u = \sin u \Rightarrow \sin^2 u - \cos^2 u = 2 \sin u \cos u \quad (2)$$

$(\sin^2 u + \cos^2 u)(\sin^2 u - \cos^2 u)$

$$\Rightarrow -(\cos^2 u - \sin^2 u) = 2 \sin u \cos u \Rightarrow \sin^2 u = -\frac{1}{2} \Rightarrow u = \left\{ 2k\pi - \frac{\pi}{4}, 2k\pi - \frac{3\pi}{4} \right\}$$

$$\Rightarrow u = \left\{ 2k\pi - \frac{\pi}{4}, 2k\pi - \frac{3\pi}{4} \right\}$$

$$ب) P \cos^p x + P \sin x \cos x = 1 \Rightarrow P \cos^p x + \underbrace{(\cos^p x + \sin^p x)}_1 - 1 = 1$$

$$\Rightarrow P \cos^p x = 1 \Rightarrow \cos^p x = \frac{1}{P} \Rightarrow \cos x = \pm \sqrt[p]{\frac{1}{P}} \Rightarrow x = \{k\pi \pm \frac{\pi}{p}\}$$

$$الف) \cot x (P \cos x + 1) = \frac{1}{\sin x} \Rightarrow \frac{\cos x}{\sin x} (P \cos x + 1) = \frac{1}{\sin x} \quad (3)$$

$$\Rightarrow \frac{P \cos^p x}{\sin x} + \frac{\cos x}{\sin x} = \frac{1}{\sin x} \Rightarrow \frac{P \cos^p x + \cos x}{\sin x} = 1 \Rightarrow P \cos^p x + \cos x = 1 \Rightarrow$$

$$P \cos^p x + \cos x - 1 = 0 \Rightarrow \underset{\cos x = t}{t} = \frac{-1 \pm \sqrt{1 - 4(P)(-1)}}{P} \Rightarrow t = -1, t = \frac{1}{P}$$

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

$$\textcircled{2} \cos x = \frac{1}{P} \Rightarrow x = \{2k\pi \pm \frac{\pi}{p}\}$$

$$ب) P \sin^p x - \sin x \cos x + \cos^p x = P \Rightarrow \sin^p x + \sin^p x + \cos^p x - \sin x \cos x = P$$

$$\Rightarrow \sin^p x - \sin x \cos x = 1 \Rightarrow \frac{1 - \cos^p x}{P} - \frac{\sin^p x}{P} = 1 \Rightarrow -\cos^p x - \sin^p x = 1$$

$$\Rightarrow \cos^p x + \sin^p x = -1 \Rightarrow \underbrace{\cos^p x + \sin^p x}_1 + P \sin^p x \cos x = 1 \Rightarrow$$

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$$P \sin^p x \cos x = 0 \Rightarrow \sin^p x = 0 \Rightarrow x = \{k\pi\} \Rightarrow \boxed{x = \{k\frac{\pi}{p}\}}$$

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$$\text{الف) } \cos\left(\frac{\pi}{4} + n\right) \cos\left(n - \frac{\pi}{4}\right) = \frac{1}{4} \Rightarrow \frac{1}{4} \left(\cos\left(\frac{\pi}{4} + n + n - \frac{\pi}{4}\right) + \cos\left(\frac{\pi}{4} + n - n + \frac{\pi}{4}\right) \right) \quad 14$$

$$\cos\left(\frac{\pi}{4} + n - n + \frac{\pi}{4}\right) = \frac{1}{4} \Rightarrow \frac{1}{4} (\cos 2n + 1) = \frac{1}{4}$$

$$\Rightarrow \cos 2n = \frac{1}{4} \Rightarrow$$

$$\text{ب) } \cos\left(2n - \frac{\pi}{4}\right) = -\sin(2n) \Rightarrow \cos\left(2n - \frac{\pi}{4}\right) = \cos\left(\frac{\pi}{4} + 2n\right)$$

$$\Rightarrow 2n - \frac{\pi}{4} = \frac{\pi}{4} + 2n + 2K\pi \Rightarrow 2n - \frac{\pi}{4} = -\left(\frac{\pi}{4} + 2n\right) + 2K\pi, \quad K \in \mathbb{Z}$$

$$\Rightarrow 2n - \frac{\pi}{4} = -2n - \frac{\pi}{4} + 2K\pi \Rightarrow 4n = 2K\pi \Rightarrow n = \frac{K\pi}{2}$$