

Viana

subject :

سما و تالیف : ۱۵

Year :

Month :

Date :

B: $x=0 \rightarrow \tan \frac{\pi}{4} = 1 \rightarrow (0,1)$

A: $-2x + \frac{\pi}{4} = \frac{\pi}{4} \Rightarrow x = -\frac{\pi}{4}$

C: $-2x + \frac{\pi}{4} = -\frac{\pi}{4} \Rightarrow x = \frac{\pi}{4}$

$\Rightarrow C-A = \frac{\pi}{2}$

$\Rightarrow S = \frac{1}{2} \times 1 \times \frac{\pi}{4}$

$\Rightarrow S = \frac{\pi}{8}$

(1)

$\frac{0}{\text{جایگاه}} \rightarrow \frac{4}{9} - \frac{2}{3} (\sin \alpha) - \frac{1}{4} \cos^2 \alpha = 0$

$\Rightarrow 16 - 24 \sin \alpha - 9(1 - \sin^2 \alpha) = 0 \Rightarrow 9 \sin^2 \alpha - 24 \sin \alpha + 7 = 0$

$\Rightarrow P = 4, S = +24 \Rightarrow \sin \alpha = \frac{21}{9} \text{ خواجه, } \sin \alpha = \frac{7}{3} = \frac{1}{3} \checkmark$

$\Rightarrow \frac{7}{3} \Rightarrow \tan \alpha = \frac{1}{\sqrt{11}} \Rightarrow 1 + \tan^2 \alpha = 1 + \frac{1}{11} = \frac{12}{11}$

$\log(\sin \alpha) - \log(-\cos \alpha) = \log 7$

$\Rightarrow \log \frac{\sin \alpha}{-\cos \alpha} = \log 7 \Rightarrow \sin \alpha = -7 \cos \alpha \Rightarrow \sin^2 \alpha = 49 \cos^2 \alpha$

$\sin^2 \alpha = 1 - \cos^2 \alpha \Rightarrow 10 \cos^2 \alpha = 1 \Rightarrow \cos \alpha = \pm \frac{1}{\sqrt{10}} \Rightarrow \cos \alpha = -\frac{1}{\sqrt{10}} \checkmark$

$\Rightarrow \sin \alpha = \frac{7}{\sqrt{10}} \Rightarrow \sin \alpha - \cos \alpha = \frac{7}{\sqrt{10}} - \frac{1}{\sqrt{10}} = \frac{6}{\sqrt{10}} = \frac{3\sqrt{10}}{5}$

$\sin^2 \theta + \cos^2 \theta = \frac{4}{9} \Rightarrow \cos^2 \theta = 1 - \sin^2 \theta \Rightarrow \sin^2 \theta - \sin^2 \theta + 1 = \frac{4}{9}$

$\Rightarrow \sin^2 \theta (\sin^2 \theta - 1) + 1 = \frac{4}{9} \Rightarrow \sin^2 \theta (-\cos^2 \theta) + 1 = \frac{4}{9}$

$\Rightarrow -\sin^2 \theta \cos^2 \theta + 1 = \frac{4}{9}$

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$$\cos^2 \theta + \sin^2 \theta = \cos^2 \theta - \cos^2 \theta + 1 = \cos^2 \theta (\cos^2 \theta - 1) + 1 \quad (3)$$

$$= \cos^2 \theta (-\sin^2 \theta) + 1 = -\sin^2 \theta \cos^2 \theta + 1 = \frac{4}{9}$$

$$\Rightarrow \cos^2 \theta + \sin^2 \theta = \frac{4}{9} \quad (4) \quad \checkmark$$

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$$\frac{\sin x (1 + \cos x)}{1 (1 - \cos x)} - \frac{\sin x (1 + \cos x)}{1 \sin x} < 0 \Rightarrow \sin x < 0 \quad (5)$$

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$$(\sin x) \left(\frac{\sin x}{\cos x} \right) - \frac{1}{\cos x} = \frac{\sin^2 x - 1}{\cos x} = \frac{-\cos^2 x}{\cos x} > 0$$

$\rightarrow \cos x < 0$

$$\Rightarrow \sin x < 0, \cos x < 0 \Rightarrow \text{دائرة ربع ثلثي}$$

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

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

$$\Rightarrow \sin^2 x = \frac{1}{13}, \cos^2 x = \frac{9}{13} \Rightarrow \sin x = \pm \frac{1}{\sqrt{13}}, \cos x = \pm \frac{3}{\sqrt{13}}$$

$$\cos x, \sin x \rightarrow \tan x + \cot x = \frac{1}{\sin x \cos x} = \frac{1}{-\frac{9}{13}} = -\frac{13}{9}$$

كلتا العلاقتين

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$$\sqrt{1 + \sin \alpha} = \sqrt{1 + \cos 2\alpha} \quad \text{فردول مراكبي} = \sqrt{2 \cos^2 \alpha} = \sqrt{2} \cos \alpha \quad (7)$$

$$\begin{aligned} \sin \alpha + \sin \alpha &= \sin(\alpha_0 + \alpha_0) + \sin(\alpha_0 - \alpha_0) \\ &= \sin \alpha_0 \cos \alpha_0 + \sin \alpha_0 \cos \alpha_0 + \sin \alpha_0 \cos \alpha_0 - \sin \alpha_0 \cos \alpha_0 \\ &= 2 \sin \alpha_0 \cos \alpha_0 = \cos 2\alpha_0 \end{aligned}$$

$$\Rightarrow \frac{\sqrt{1 + \sin \alpha}}{\sin \alpha + \sin \alpha} = \frac{\sqrt{2} \cos \alpha_0}{\cos 2\alpha_0} = \sqrt{2}$$

$$1 - 2 \sin^2 \alpha \quad \text{فردول مراكبي} = \cos 2\alpha$$

$$2 \cos^2 \alpha - 1 = \cos 2\alpha \quad \frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha} = \cos 2\alpha = \frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha} \quad (8)$$

$$\begin{aligned} \Rightarrow \cos 2\alpha \times \cos 2\alpha \times \cos 2\alpha \times \sin \alpha &= \frac{1}{\lambda} \frac{\sin \alpha}{\sin \alpha} = \frac{1}{\lambda} \frac{\cos 2\alpha}{\sin \alpha} \\ &= \frac{1}{\lambda} \cot \alpha \end{aligned}$$

$$\omega \cos 2\alpha - 12 \cos \alpha = \omega (2 \cos^2 \alpha - 1) - 12 \cos \alpha = 10 \cos^2 \alpha - 12 \cos \alpha - \omega \quad (9)$$

$$\begin{aligned} \sin \alpha + 3 \cos \alpha &= 2 - \sin \alpha \Rightarrow \sin \alpha = 2 - 3 \cos \alpha \quad \text{فردول مراكبي} \quad \sin^2 \alpha = 4 \cos^2 \alpha - 12 \cos \alpha + 4 \\ \sin^2 \alpha &= 1 - \cos^2 \alpha \quad 10 \cos^2 \alpha - 12 \cos \alpha + 3 = 0 \Rightarrow 10 \cos^2 \alpha - 12 \cos \alpha - \omega = -1 \end{aligned}$$

$$\Rightarrow \omega \cos 2\alpha - 12 \cos \alpha = -1$$

$$\cos^2 A = \frac{1 + \cos A}{2} \quad 2 \sin B \sin C = 1 + \cos A \quad (10)$$

$$2 \sin B \sin C = 1 - \cos(B+C) \Rightarrow 2 \sin B \sin C = 1 - \cos B \cos C + \sin B \sin C$$

$$\Rightarrow \cos B \cos C + \sin B \sin C = 1 \Rightarrow \cos(B-C) = 1 \Rightarrow B-C=0 \Rightarrow B=C$$

$$\Rightarrow B=C=12 \Rightarrow A=180-2(12)=156 \Rightarrow \hat{A}=156^\circ$$

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