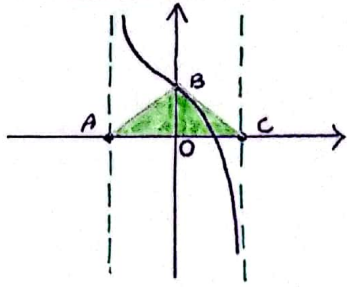


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روز دهم، جلسه A

نام: مبین ضای



$$\begin{cases} -2x + \frac{\pi}{4} = \frac{\pi}{4} \rightarrow x = -\frac{\pi}{8} \\ -2x + \frac{\pi}{4} = -\frac{\pi}{4} \rightarrow x = \frac{3\pi}{8} \end{cases}$$

$$AC = \frac{3\pi}{8} - (-\frac{\pi}{8}) = \frac{4\pi}{8}$$

$$OB = \tan(-2(0) + \frac{\pi}{4}) = 1$$

$$S_{\triangle ABC} = \frac{AC \times OB}{2} = \frac{\frac{4\pi}{8} \times 1}{2} = \frac{\pi}{4}$$

جواب سوال ①

$$x^2 - (\sin \alpha)x - \frac{1}{4} \cos^2 \alpha = 0$$

جواب سوال ②

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

$$\begin{cases} x = \frac{\sin \alpha + 1}{2} = \frac{1}{2} \rightarrow 2 \sin \alpha + 2 = 2 \rightarrow \sin \alpha = 0 \rightarrow \cos \alpha = \frac{\sqrt{3}}{2} \\ x = \frac{\sin \alpha - 1}{2} = -\frac{1}{2} \end{cases}$$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} = \frac{1}{\frac{1}{4}} = 4 \rightarrow \tan \alpha = \pm 2$$

$$\sin^2 \alpha - \sin^2 \alpha + 1 = \frac{4}{5} \quad \sin^2 \alpha = x \rightarrow x^2 - x + \frac{1}{5} = 0 \quad \Delta = \frac{\sqrt{9}}{5}$$

جواب سوال ④

$$\sin \alpha \begin{cases} \frac{1+\sqrt{5}}{10} \rightarrow \cos^2 \alpha = \frac{2-\sqrt{5}}{10} \rightarrow \cos^2 \alpha = \frac{3-\sqrt{5}}{10} \\ \frac{1-\sqrt{5}}{10} \rightarrow \cos^2 \alpha = \frac{2+\sqrt{5}}{10} \rightarrow \cos^2 \alpha = \frac{3+\sqrt{5}}{10} \end{cases}$$

البته می دانستیم که
 $\sin^2 \alpha + \cos^2 \alpha = \cos^2 \alpha + \sin^2 \alpha$

$$\sin^2 \alpha + \cos^2 \alpha = \frac{1+\sqrt{5}+3-\sqrt{5}}{10} = \frac{4}{10} \quad \Delta = \frac{2-\sqrt{5}+3+\sqrt{5}}{10} = \frac{4}{10} \rightarrow \text{جواب آخر}$$

جواب سوال ۳

$$\frac{\sin \alpha}{-\cos \alpha} = \psi \rightarrow -\psi \cos \alpha = \sin \alpha \xrightarrow{!} \tan \alpha = -\psi$$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \Rightarrow \cos^2 \alpha = \frac{1}{10} \rightarrow \cos \alpha = \frac{\sqrt{10}}{10}$$

$$\frac{\sin \alpha - \cos \alpha}{-\psi \cos \alpha} = -\psi \cos \alpha \rightarrow$$

$$-\psi \left(\frac{\sqrt{10}}{10} \right) = \frac{-\psi \sqrt{10}}{10}$$

جواب سوال ۴

$$\frac{\psi}{\sin x} + \frac{\psi}{\cos x} = 0 \rightarrow \frac{\psi \cos x + \psi \sin x}{\sin x \cdot \cos x} = 0$$

$$\psi \cos x + \psi \sin x = 0 \rightarrow \psi \cos x = -\psi \sin x \rightarrow \cos x = \frac{-\psi}{\psi} \sin x$$

$$\tan x + \cot x = \frac{\psi}{\sin^2 x} \quad \left(\sin^2 x = \psi \cdot \sin x \cdot \left(\frac{-\psi}{\psi} \sin x \right) = -\psi \sin^2 x \right)$$

$$\tan x = \frac{\sin x}{-\frac{\psi}{\psi} \sin x} = \frac{-\psi}{\psi} \quad \cot x = \frac{\frac{-\psi}{\psi} \sin x}{\sin x} = \frac{-\psi}{\psi}$$

$$\tan x + \cot x = \frac{-\psi - \psi}{\psi} = \frac{-2\psi}{\psi}$$

جواب سوال ۵

$$\frac{\psi \sin x + \sin x \cos x}{\psi - \psi \cos^2 x} < 0 \rightarrow \frac{\sin x (\psi + \cos x)}{\psi (\sin^2 x)} < 0 \rightarrow \frac{\psi + \cos x}{\psi \sin} < 0$$

← $\psi + \cos x$ چون $\cos$ بین -1 و 1 متغیر است و ψ مثبت است پس $\psi + \cos x$ همیشه مثبت است.

$$\sin x \tan x - \frac{1}{\cos x} > 0 \rightarrow \frac{\sin^2 x - 1}{\cos x} > 0 \rightarrow \frac{-\cos^2 x}{\cos x} = -\cos x > 0 \quad \cos = -$$

← $\sin$ و $\cos$ هر دو منفی (رج سوم)

جواب سوال ۸

$$\frac{(1 - \psi \sin^2 \alpha)}{\cos \alpha} \cdot \frac{(\psi \cos^2 \alpha - 1)}{\cos \alpha} \cdot \frac{(1 - \tan^2 \alpha)}{1 + \tan^2 \alpha} = \cos \alpha_1 \cdot \cos \alpha_2 \cdot \cos \alpha_3$$

عبارت را در $\sin \alpha$ ضرب و تقسیم می کنیم.

$$\frac{\sin \alpha_1 \times \cos \alpha_1 \times \cos \alpha_2 \times \cos \alpha_3}{\sin \alpha} = \frac{1}{\psi} \frac{\sin \alpha_1 \times \cos \alpha_1 \times \cos \alpha_2}{\sin \alpha} = \frac{1}{\psi} \frac{\sin \alpha_1 \times \cos \alpha_2}{\sin \alpha} = \frac{1}{\psi} \frac{\sin \alpha_1}{\sin \alpha}$$

$$\sin \alpha_1 = \cos \alpha_1 \rightarrow \frac{1}{\psi} \frac{\cos \alpha_1}{\sin \alpha_1} = \frac{\cot \alpha_1}{\psi} = \frac{1}{\psi} \cot \alpha_1 \rightarrow$$