

کتاب ۱۴ - دوازدهم

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صالح علی

$$\frac{y}{x} = \tan \hat{\alpha} = \cot \alpha \Rightarrow y = \cot \alpha \cdot x \Rightarrow A \left| \frac{\cos \hat{\alpha}}{\sin \hat{\alpha}} \right| \Rightarrow A \left| \frac{\sin \alpha}{\cos \alpha} \right| \Rightarrow B \left| \cot \alpha \right| \quad (1)$$

$$AB = \sqrt{(\sin \alpha - 1)^2 + (\cot \alpha - \cos \alpha)^2} = \sqrt{\sin^2 \alpha + 1 - 2 \sin \alpha + \frac{\cos^2 \alpha}{\sin^2 \alpha} - 2 \cot \alpha \cos \alpha + \cos^2 \alpha}$$

$$\sqrt{\sin^2 \alpha + \sin^2 \alpha - 2 \sin^3 \alpha + \cos^2 \alpha - 2 \cot \alpha \sin \alpha \cos \alpha - 2 \cot \alpha \sin \alpha \cos \alpha} = \sqrt{\frac{2 \sin^2 \alpha (1 - \cos \alpha) + 1 + \sin^2 \alpha - 2 \sin \alpha}{\sin^2 \alpha}}$$

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

$$\sqrt{\frac{\sin^2 \alpha - \sin^2 \alpha - 2 \sin \alpha + 1}{\sin^2 \alpha}}$$

$$\left. \begin{aligned} \frac{\sin^2 \alpha}{4} &= \frac{\sin \alpha}{AB} \\ \frac{\sin^2 \alpha}{16} &= \frac{\sin \alpha}{AC} \end{aligned} \right\} \div \frac{AC}{AB} = \frac{\sqrt{13}}{4 \times \frac{1}{4}} \Rightarrow \frac{AB}{AC} = \frac{4}{\sqrt{13}} \quad D_1 = \alpha \Rightarrow D_2 = 180^\circ - \alpha \Rightarrow \sin \hat{D}_1 = \sin \hat{D}_2 \quad (2)$$

$$A = \frac{\pi}{16} \Rightarrow AB = \sqrt{\left(\frac{\sqrt{13}}{4} - \frac{1}{4}\right)^2 + \left(\frac{\sqrt{13}}{4} - \frac{1}{4}\right)^2} = \frac{\sqrt{13} - 1}{4} \times \sqrt{2}$$

$$B = \frac{3\pi}{8}$$

$$C = \frac{5\pi}{8} \Rightarrow AC = \left(\frac{1}{4}\right)^2 + \left(\frac{\sqrt{13}}{4} + 1\right)^2$$

(3)

$$S_{\Delta} = \frac{1}{2} \times AB \times AC \times \sin \alpha = \frac{1}{2} \times \log_4^{\sqrt{13}} \times \log_4^{\sqrt{13}} \times \frac{1}{2} = \frac{1}{2} \times \sqrt{13} \times \sqrt{13} \times \frac{1}{2} = \frac{13}{2} \quad (15)$$

$\log_4^{\sqrt{13}} = \frac{1}{\log_4 4}$

$$\frac{2 \cos^2 \alpha - \cos^2 \alpha - (\sin^2 \alpha \times (\frac{1}{2} \sin^2 \alpha - 1))}{\cos^2 \alpha + \cos^2 \alpha} = 1 \rightarrow \quad \text{نشان بدهیم:}$$

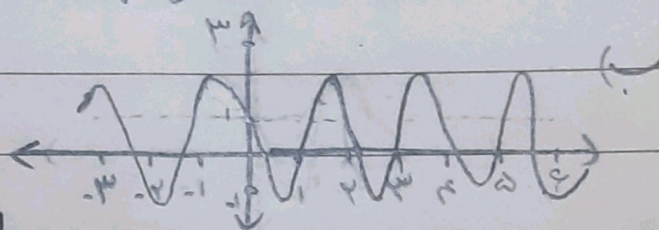
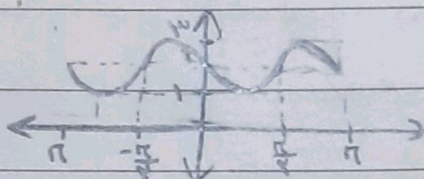
$$\begin{aligned} 2 \cos^2 \alpha - \cos^2 \alpha + \sin^2 \alpha \cos^2 \alpha - \sin^2 \alpha &= (\sin^2 \alpha + \cos^2 \alpha)(\cos^2 \alpha - \sin^2 \alpha) - \cos^2 \alpha (1 - \sin^2 \alpha) \\ &= \cos^2 \alpha - \sin^2 \alpha = \cos^2 \alpha = 1 \rightarrow \sin^2 \alpha = 0 \end{aligned}$$

$$y = -2 \sin \alpha \cos \alpha + 2 = -\sin 2\alpha + 2 \quad (16)$$

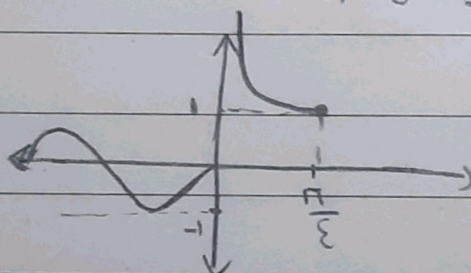
$$T = \frac{2\pi}{2} = \pi$$

$$y = 2 \cos(\alpha + \frac{\pi}{2}) + 1 = -2 \sin(\alpha) + 1$$

$$T = \frac{2\pi}{1} = 2\pi$$



$$f(x) = \begin{cases} \cot x & : x \in (\frac{\pi}{2}, \pi) \\ \sin x & : x \in [0, \frac{\pi}{2}] \end{cases}$$



$$R_f = [-1, +\infty)$$

$$\cot \frac{\pi}{2} = 1$$

$$\sin 0 = 0$$

$$f(x) = a + \frac{b}{x} \sin(2cx) \cos(2cx) = a + \frac{b}{x} \sin(4cx), \quad T = \frac{\pi}{4} - \frac{\pi}{1} = \frac{3\pi}{4} = \frac{3\pi}{4c} \quad (17)$$

$$\rightarrow c = \frac{4}{3}, \quad \text{max} - \text{min} = 4 \rightarrow \text{در برابر حالت اولی} \rightarrow \frac{b}{x} = 2 \rightarrow b = 2$$

$$\text{min} \rightarrow \text{باید ۲- می بود} \rightarrow a = 2 \rightarrow \frac{b \times c}{a} = 1 \times \frac{4}{3} \times \frac{1}{2} = \frac{2}{3}$$

دلی ۲ تا آورد و منفی شد

$$T = \frac{2\pi}{1} = 2\pi, \quad |b| = 2 \rightarrow b = 2, \quad \text{max} - \text{min} = 4 = |a| \rightarrow |a| = 3, \quad \text{نمودار قرینه شد} \quad (18)$$

نقطه بر محور مثل نمودار

$$\text{max} \rightarrow \text{باید ۳ می بود} \rightarrow \text{نقطه ۱- را به دست آورد} \rightarrow c = -1, \quad a = -3$$

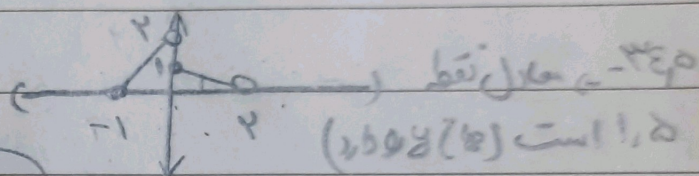
$$f(x) = 3 \cos(2x) - 1 \rightarrow -3 \cos(2\alpha) - 1 = 0 \rightarrow \cos(2\alpha) = -\frac{1}{3}$$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \rightarrow \tan^2(2\alpha) = \frac{1}{\frac{1}{9}} - 1 = 8 \rightarrow |\tan 2\alpha| = 2\sqrt{2}$$

$$T = \mathbb{R} \rightarrow \dots [-3, -1), [-1, 2), [2, 5), \dots$$

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$$\rightarrow -3n + 2 \rightarrow x = \frac{-3}{1} \rightarrow (-3, 2)$$



$$\rightarrow \text{مثال: } y = -\frac{x}{2} + 1 \rightarrow \left(-\frac{3}{2} \times \frac{1}{2}\right) + 1 = \left(\frac{1}{2}\right)$$