

$$\tan(\frac{\pi}{4} - \alpha) = \cot \alpha$$

$$OB = \sqrt{1 + \cot^2 \alpha} = \frac{1}{\sin \alpha} \quad OA = 1 \rightarrow -OA \rightarrow OB - OA = \frac{1}{\sin \alpha} - 1$$

$$\Rightarrow AB = \frac{1}{\sin \alpha} - 1$$

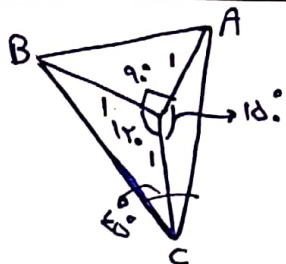
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$$\frac{AC}{\sin \alpha} = \frac{r}{\sin \frac{\pi}{4}}$$

$$\frac{AB}{\sin(\frac{\pi}{4} - \alpha)} = \frac{r}{\sin \alpha}$$

$$\left(\div \right) \rightarrow \frac{AC}{AB} = \frac{r \times r}{r \times \sqrt{2}} = \frac{1}{\sqrt{2}} \Rightarrow \frac{AB}{AC} = \sqrt{2}$$

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فرض کنیم $BC = \sqrt{3}$ و $AC = \sqrt{2 + \sqrt{3}}$ ، فرض کنیم $AB = \sqrt{2}$

$$S = \frac{1}{2} BC \times AC \times \sin 15^\circ = \frac{1}{2} \times \sqrt{3} \times \sqrt{2 + \sqrt{3}} = \frac{\sqrt{3}}{2} \times \sqrt{2 + \sqrt{3}}$$

$$\frac{r}{\sin \alpha} = \frac{r}{\sin \frac{\pi}{4}} + \frac{r}{\sin \frac{\pi}{4}}$$

AB BC AC

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$$S = AB \times AC \times \sin \alpha \times \frac{1}{2} \Rightarrow S = \frac{1}{2} \times \frac{1}{2} \times \frac{\sqrt{3}}{\sqrt{2}} \times \frac{\sqrt{3}}{\sqrt{2}} = \frac{3}{4} = S$$

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$$r \cos^2 \alpha - r \sin^2 \alpha (-\cos 2\alpha) \rightarrow r(n) \times (n - \cos \alpha) + 1$$

$$n = \cos \alpha \Rightarrow r \cos^2 \alpha - \cos^2 \alpha + \sin^2 \alpha \cos 2\alpha = 1$$

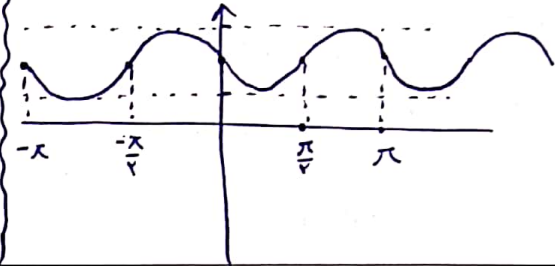
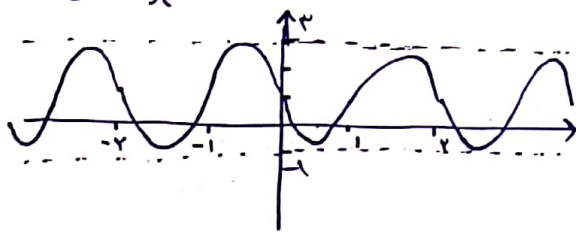
$$\cos^2 \alpha (\cos^2 \alpha - 1) + \sin^2 \alpha \cos 2\alpha \Rightarrow (\sin^2 \alpha + \cos^2 \alpha) (\cos \alpha) = 1$$

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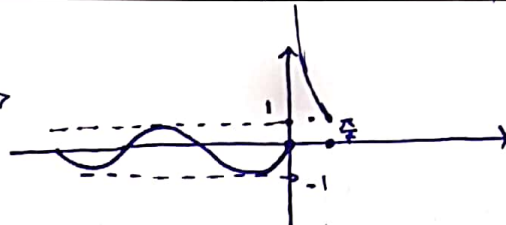
$$\Rightarrow \cos 2\alpha = 1 \rightarrow \sin 2\alpha = 0$$

$$y = 2 \cos\left(\pi x + \frac{\pi}{4}\right) + 1 = 2 \sin \pi x + 1 \quad \rightarrow \quad y = -\sin 2x + 2 \quad T = \frac{2\pi}{|b|} = \pi$$

$$T = \frac{2\pi}{b} = \frac{2\pi}{\pi} = 2 \quad \max = 2+1=3, \min = -2+1=-1$$



$$f(x) = \begin{cases} \cot x & ; 0 < x < \frac{\pi}{2} \\ \sin x & ; x \leq 0 \end{cases} \Rightarrow$$



$$\text{بازویب نمودار} \rightarrow R_f = [-1, +\infty)$$

$$a + \frac{b}{c} \sin(\pi \cos x) \cos \pi x = a + \frac{b}{c} \sin \pi c x \quad \text{بازویب نمودار} \rightarrow a > 0, b > 0, c > 0$$

$$T = \frac{2\pi}{c} = \frac{\pi}{1} \Rightarrow c = 2, 5$$

$$\left. \begin{array}{l} \min = 0 = a - \frac{b}{c} \\ \max = 1 = a + \frac{b}{c} \end{array} \right\} \rightarrow \begin{cases} a = 2 \\ b = 1 \\ c = 2, 5 \end{cases}$$

$$\text{بازویب نمودار} \rightarrow \max = 2 \Rightarrow |a| + d = 2 \rightarrow d = -1$$

$$\min = -1 \Rightarrow -|a| + d = -1 \rightarrow |a| = 3$$

$$T = \pi \Rightarrow \frac{2\pi}{|b|} = \pi \rightarrow |b| = 2 \Rightarrow b = \pm 2 \rightarrow \text{در بایج کینون ضرب} \rightarrow b = 2$$

تاییدی انجام دنی کند

$$f(x) = -2 \cos 2x - 1 \xrightarrow{x=\frac{\pi}{2}} -2 \cos \pi - 1 = 0 \rightarrow \cos 2x = -\frac{1}{2} \xrightarrow{\sin^2 + \cos^2 = 1} |\sin 2x| = \frac{\sqrt{3}}{2}$$

$$|\tan 2x| = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$T = 2 \rightarrow f(kT + x) = f(x)$$

$$f((-17)\pi + 1, 5) = f(1, 5)$$

$$f(1, 5) \rightarrow m = \frac{1}{\pi}, b = 1 \rightarrow -0,5x + 1 \rightarrow x = 1,5 \Rightarrow f(1,5) = -0,5(1,5) + 1 = 0,25$$