

$$OA = OT = 1$$

$$\angle AOT = \frac{\pi}{4} - \alpha \rightarrow TB = \tan\left(\frac{\pi}{4} - \alpha\right) = \cot(\alpha)$$

$$OB = \sqrt{OT^2 + TB^2} = \sqrt{1 + \cot^2 \alpha} = \frac{1}{\sin \alpha} \xrightarrow{OA=1} AB = \frac{1 - \sin \alpha}{\sin \alpha}$$

$$\triangle ADB \rightarrow \frac{\sin \alpha}{y} = \frac{\sin(\pi - \alpha)}{AB} = \frac{\sin \alpha}{AB}$$

$$\triangle ADC \rightarrow \frac{\sin \alpha}{r} = \frac{\sin \alpha}{AC}$$

$$\sin \alpha = \frac{AB \sqrt{y}}{12} = \frac{AC}{y}$$

$$\Rightarrow \frac{AB}{AC} = \frac{1}{\sqrt{y}}$$

$$\left. \begin{array}{l} A \left| \begin{array}{l} \frac{1}{y} \\ ? \end{array} \right. \xrightarrow[\text{تایید می شود}]{x^2 + y^2 = 1} A \left| \begin{array}{l} \frac{1}{\sqrt{r}} \\ \frac{y}{r} \end{array} \right. : \theta_A = 90^\circ \\ B \left| \begin{array}{l} ? \\ \frac{1}{y} \end{array} \right. \xrightarrow[\text{تایید می شود}]{x^2 + y^2 = 1} B \left| \begin{array}{l} -\frac{\sqrt{r}}{r} \\ \frac{1}{r} \end{array} \right. : \theta_B = 180^\circ \end{array} \right\}$$

$$C \left| \begin{array}{l} 0 \\ -1 \end{array} \right. : \theta_C = 270^\circ$$

$$\widehat{AB} = 90^\circ$$

$$\widehat{BC} = 180^\circ$$

$$\widehat{AC} = 90^\circ$$

$$BC = r \sin\left(\frac{180^\circ}{y}\right) = \sqrt{r}$$

$$\text{قضیه کوسین: } \sqrt{R^2 + R^2 - 2RC \cos \theta} = R \sqrt{2 - 2 \cos \theta} = R \sqrt{4 \sin^2 \frac{\theta}{2}} = 2R \sin \frac{\theta}{2}$$

$$AB = 2 \sin\left(\frac{90^\circ}{y}\right) = \sqrt{y}, \quad AC = 2 \sin\left(\frac{90^\circ}{y}\right) = \frac{\sqrt{y} + \sqrt{r}}{y}$$

$$\text{مساحت: } 2P = \frac{\sqrt{y} + \sqrt{r}}{y} + \sqrt{r} \cdot \sqrt{y} \rightarrow \text{مساحت} = \frac{\sqrt{y} + \sqrt{r}}{y} + \sqrt{r} \cdot \sqrt{y}$$

$$S = \frac{1}{2} ab \sin \widehat{C} = \frac{1}{2} (\sqrt{r})(\sqrt{y}) \left(\frac{\sqrt{y} + \sqrt{r}}{y} \right) = \frac{y + \sqrt{r}}{1}$$

$$AC = \log_3^{19}, \quad AB = \log_3^{20} = 2 \log_3^2$$

$$= 2 \log_3^2 \quad \left\{ \begin{array}{l} S = \frac{1}{2} AC \cdot AB \sin \widehat{A} = \frac{1}{2} (2 \log_3^2) (2 \log_3^2) \left(\frac{1}{2} \right) = 2 \end{array} \right.$$

Subject

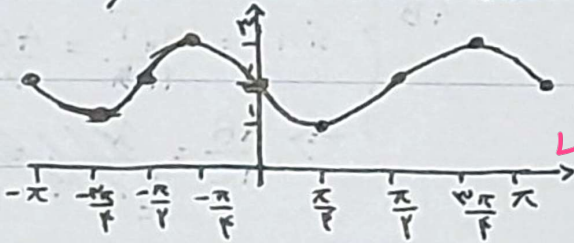
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$$f(x) = \sqrt{x^2 - x^2} - \sin^2(x) (\sqrt{\sin^2(x)} - 1) \quad (a)$$

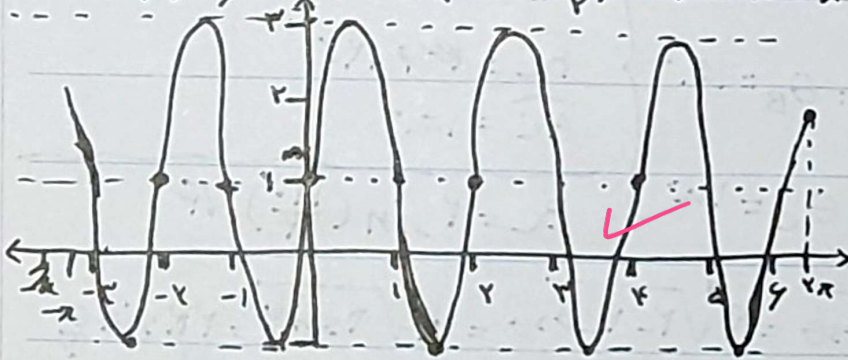
$$\rightarrow f(\cos x) = \cos^2 x (\underbrace{\sqrt{\cos^2 x} - 1}_{\cos x}) + \sin^2 x (\underbrace{\sqrt{\sin^2 x} - 1}_{\sin x}) = \cos^2 x - \sin^2 x$$

$$f(\cos x) = \cos^2 x - \sin^2 x = 1 \rightarrow \sin(x) = 0$$

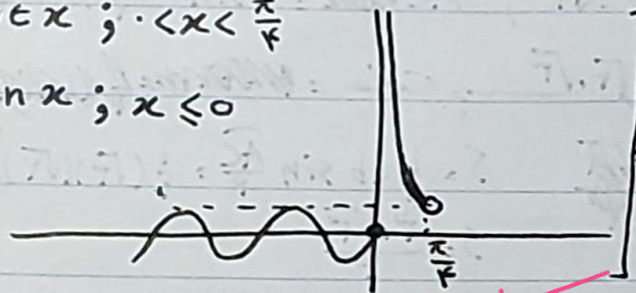
$$c) \Rightarrow y = -\sqrt{x} \sin x \cos x + \sqrt{x} = -\sin(\sqrt{x}) + \sqrt{x} \rightarrow T = \left| \frac{\sqrt{x}}{b} \right| = \pi \quad (b)$$



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



$$f(x) = \begin{cases} \cos x & ; 0 < x < \frac{\pi}{4} \\ \sin x & ; x \leq 0 \end{cases}$$



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

$$f(x) = a + b \underbrace{\sin(cx) \cos(cx) \cos(\gamma cx)}_{\frac{1}{\gamma} \sin(\gamma cx)} = a + \frac{b}{\gamma} \sin(\gamma cx) \quad (1)$$

$$\text{شکل} \Rightarrow T = \frac{\pi}{\gamma} - \frac{\pi}{1} = \frac{\gamma\pi}{\omega} = \left| \frac{\gamma x}{\gamma c} \right| \xrightarrow{c} c = \frac{\omega}{\gamma}$$

$$\text{شکل} \Rightarrow \max: a + \left| \frac{b}{\gamma} \right| = r \quad \left\{ \begin{array}{l} |b| = 1 \\ a = r \end{array} \right.$$

$$a - \left| \frac{b}{\gamma} \right| = 0$$

$$f(x) = \frac{\gamma}{\gamma} + \left(\frac{b}{\gamma} \right) \sin(\gamma x) \longrightarrow f\left(\frac{\pi}{1}\right) = \gamma + \frac{b}{\gamma} = r \rightarrow b = \gamma$$

$$\rightarrow \frac{bc}{a} = \frac{1 \times \frac{\omega}{\gamma}}{\gamma} = \omega \quad \checkmark$$

$$f(x) = a \cos(bx) + c \rightarrow T = \left| \frac{\gamma\pi}{b} \right| = \pi \rightarrow |b| = \gamma \quad (9)$$

$$\text{شکل} : \left\{ \begin{array}{l} |a| + c = r \\ -|a| + c = -r \end{array} \right\} \begin{array}{l} c = -1 \\ |a| = r \xrightarrow{\text{شکل}} a = -r \end{array}$$

$$\rightarrow f(x) = -r \cos(\gamma x) - 1 \rightarrow \cos(\gamma x) = -\frac{1}{r}$$

$$\tan(\gamma x) = \frac{1}{\cos(\gamma x)} - 1 = 1 \rightarrow |\tan(\gamma x)| = \sqrt{r} \quad \checkmark$$

$$f(-r, \gamma, \omega) = f(r, -r, \omega) = f(1, \omega) \quad (11)$$

$$\text{شکل} \Rightarrow f(x) = \begin{cases} 1 - \frac{x}{\gamma} & ; a \leq x < r \\ \gamma x + \gamma & ; -1 \leq x < 0 \end{cases} \rightarrow f(1, \omega) = 1 - \frac{r}{\gamma} = \frac{1}{\gamma} \quad \checkmark$$