

$$\alpha + 0_1 = \frac{\pi}{4} \Rightarrow \cos 0_1 = \frac{OT}{OB} \Rightarrow \cos 0_1 = \frac{1}{1+AB} \Rightarrow \sin \alpha = \frac{1}{1+AB}$$

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

$$S_{ADC} = \frac{1}{2} S_{ABC} \Rightarrow S_{ADC} = \frac{1}{2} \times AD \times AC \times \sin \psi \Rightarrow S_{ABD} = \frac{1}{2} S_{ABC} \Rightarrow S_{ABD} = \frac{1}{2} \times AD \times AB \times \sin \omega$$

$$\Rightarrow \frac{AB}{AC} = \frac{1}{\sqrt{2}} = \sqrt{2}$$

$$A(1, 0) \Rightarrow 0_1 = 0^\circ = \frac{0\pi}{2} \text{ و } B(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}) \Rightarrow 0_2 = 45^\circ = \frac{\pi}{4}$$

$$AO = BO = CO = r = 1 \Rightarrow A(1, 0) \Rightarrow \sqrt{(\frac{1}{\sqrt{2}})^2 + (\frac{1}{\sqrt{2}})^2} = \sqrt{\frac{1}{2} + \frac{1}{2}} = 1 \text{ و } B(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$$

$$AB = \sqrt{(\frac{1}{\sqrt{2}} - \frac{\sqrt{2}}{2})^2 + (\frac{1}{\sqrt{2}} - \frac{\sqrt{2}}{2})^2} \Rightarrow AB = \sqrt{2} \Rightarrow \sqrt{2}P = \sqrt{2} + \sqrt{2} + \sqrt{2} = 3\sqrt{2}$$

$$0_1 = 0^\circ, 0_2 = 45^\circ \Rightarrow 0_3 = 90^\circ (A \hat{O} B) \Rightarrow S_{ABC} = S_{AOC} + S_{AOB} + S_{BOC}$$

$$\Rightarrow \frac{1}{2} \times 1 \times 1 \times \sin 90^\circ + \frac{1}{2} \times 1 \times 1 \times \sin 45^\circ + \frac{1}{2} \times 1 \times 1 \times \sin 45^\circ = \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{3}{2}$$

$$c^2 = a^2 + b^2 - 2ab \cos \psi \Rightarrow b^2 - a^2 + (a^2 - c^2) = 0$$

$$\Rightarrow b = \frac{(a^2 + \sqrt{4a^2 - a^2})}{2} \Rightarrow S = \frac{1}{2} ab \sin \psi = \frac{a^2 b}{2}$$

$$\Rightarrow S = \frac{a^2 (a^2 + \sqrt{4a^2 - a^2})}{2} \Rightarrow a = \sqrt{\log \frac{1}{2}} \text{ و } c = \sqrt{\log \frac{1}{2}}$$

$$\Rightarrow \sqrt{4a^2 - a^2} = \frac{3a}{2} - 1 \Rightarrow a^2 = \frac{(4 - 1)a^2}{4} \times \sqrt{4a^2 - a^2} = \frac{(3a^2 - 4a^2)}{4}$$

$$S = \frac{1}{2} \sqrt{(\log \frac{1}{2})^2 + 9 - 4(\log \frac{1}{2})^2}$$

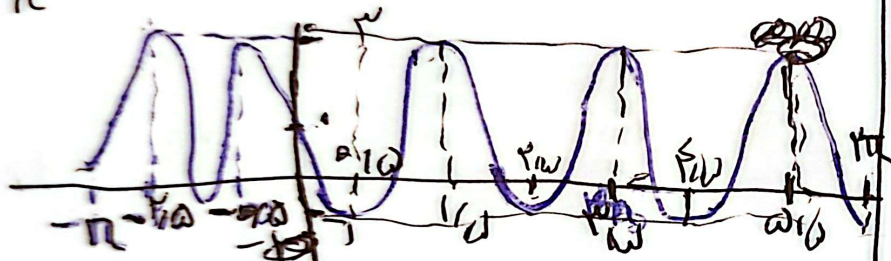
$$r \cos^2 \alpha - \cos^2 \alpha - r \sin^2 \alpha \sin \alpha = 1 \Rightarrow r(\cos^2 \alpha - \sin^2 \alpha) + \sin^2 \alpha \cos^2 \alpha = 1$$

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

$$\Rightarrow \cos^2 \alpha - \sin^2 \alpha = 1 \Rightarrow \cos^2 \alpha = 1 \Rightarrow \sin^2 \alpha = 1 - \cos^2 \alpha = 0$$

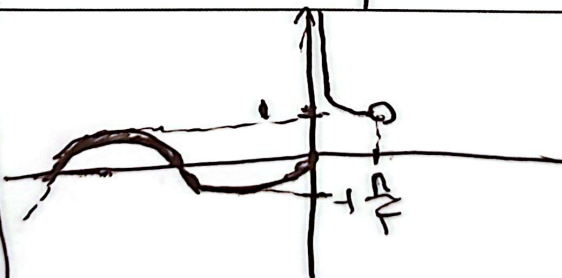
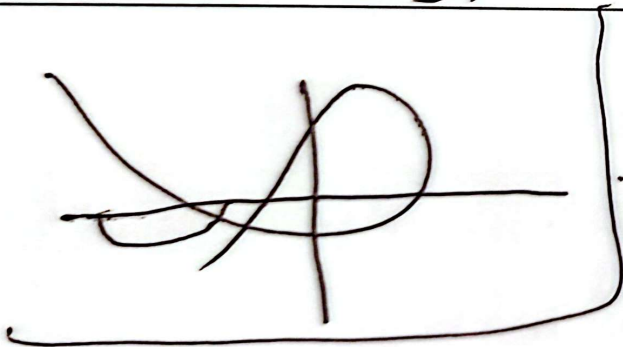
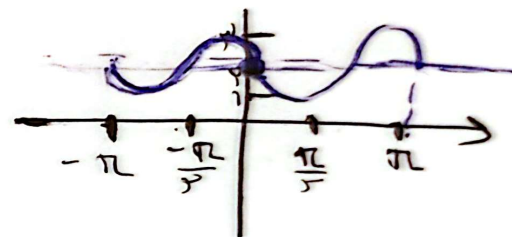
$$y = y \cos(\pi x + \frac{\pi}{2}) + 1 = -y \sin \pi x + 1$$

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



نقاط $0, \pi, 2\pi, \dots$ روی محور x است

$$y = -\sin 2x + 2 \quad T = \frac{2\pi}{2} = \pi$$



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

$$a + b \sin(x) \cos(x) \cos(x) = a + \frac{b}{2} \sin(2x) \cos(x) = a + \frac{b}{2} \sin(2x)$$

$$\Rightarrow f(x) = a + \frac{b}{2} \sin(2x) \Rightarrow T = \frac{2\pi}{2} = \pi = \frac{2\pi}{\omega} \Rightarrow \omega = \frac{2}{\pi} \quad (1)$$

(2) $a + \frac{b}{2} = 5$
 $a - \frac{b}{2} = 0$

$$\Rightarrow \boxed{a=5} \Rightarrow f(x) = 5 + 5 \sin(2x)$$

$$\frac{b}{2} = 5 \Rightarrow \boxed{b=10} \Rightarrow \frac{bC}{a} = \frac{10 \cdot \frac{2}{\pi}}{5} = \frac{4}{\pi} = \omega$$

$$\Rightarrow \text{مثبت } a < 0 \Rightarrow b > 0 \Rightarrow T = \frac{2\pi}{\omega} = \pi \Rightarrow \boxed{b=2}$$

$$-a + C = 3$$

$$a + C = 5$$

$$\frac{2C}{2} = -2 \Rightarrow \boxed{C=-1}$$

$$\boxed{a=-3}$$

$$\Rightarrow f(x) = -3 \cos(2x) - 1$$

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

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \Rightarrow 1 + \tan^2 \alpha = 9 \Rightarrow |\tan \alpha| = 2\sqrt{2}$$

$$T = \pi \Rightarrow f(x) = f(x + \pi) \rightarrow f(-\pi/2) = (1, \omega - \pi/2)$$

$$\Rightarrow f(1, \omega - \pi/2) = f(1, \omega) \Rightarrow \text{در این شیب} = f(x) = \frac{1}{2}x + 1$$

$0 \leq x < 2$

$$\Rightarrow f(1, \omega) = 0, 1, \omega + 1 = 0, 1, \omega \neq \frac{1}{2}$$