

14, 15

نام و نام خانوادگی کلاس شماره تکلیف شماره پاسخنامه تشریحی

$$\alpha + \theta_1 = \frac{\pi}{4} \Rightarrow \cos \theta_1 = \frac{OT}{OB} \Rightarrow \cos \theta_1 = \frac{1}{1+AB} \Rightarrow \sin \alpha = \frac{1}{1+AB}$$

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

(2)

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

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

(2)

$$A \in \left(\frac{\pi}{4}, \frac{\pi}{2} \right) \Rightarrow \theta_1 = \varphi = \frac{\pi}{4} \text{ و } B \in \left(\frac{\pi}{2}, \frac{3\pi}{4} \right) \Rightarrow \theta_2 = \omega = \frac{3\pi}{4}$$

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

$$AB = \sqrt{\left(\frac{1}{2} - \frac{\sqrt{2}}{2} \right)^2 + \left(\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} \right)^2} \Rightarrow AB = \sqrt{2} \Rightarrow \sqrt{2}P = \sqrt{2} + \sqrt{2} + \sqrt{2} + \sqrt{2} = 4\sqrt{2}$$

$$\theta_1 = \varphi, \theta_2 = \omega \Rightarrow \theta_3 = \theta_1 + \theta_2 = \frac{5\pi}{4} \Rightarrow S_{ABC} = S_{AOC} + S_{AOB} + S_{BOC}$$

$$\Rightarrow \frac{1}{2} \times 1 \times 1 \times \sin \frac{\pi}{4} + \frac{1}{2} \times 1 \times 1 \times \sin \frac{\pi}{4} + \frac{1}{2} \times 1 \times 1 \times \sin \frac{3\pi}{4} = \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{3}{2} \checkmark$$

(1, 15)

$$c^2 = a^2 + b^2 - 2ab \cos \omega \Rightarrow b^2 - a^2 + 2ab \cos \omega = c^2$$

$$\Rightarrow b = \frac{c(a \cos \omega + \sqrt{c^2 - a^2})}{2} \Rightarrow S = \frac{1}{2} ab \sin \omega = \frac{a \cdot b}{2}$$

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

$$\Rightarrow \frac{c^2 - a^2}{2} = \frac{36}{4} - \frac{144}{4} = \frac{(6^2 - 12^2)}{4} \times \sqrt{c^2 - a^2} = \frac{(2^2 - 12^2)}{4}$$

$$S = \frac{2 \times 12}{2} (\log \frac{1}{2})^2 + \sqrt{9 - 4(\log \frac{1}{2})^2}$$

(2)

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

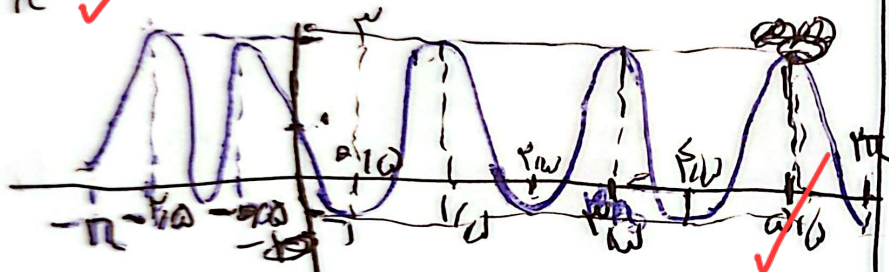
$$r (\cos^2 \alpha + \sin^2 \alpha) (\cos^2 \alpha - \sin^2 \alpha) + \sin^2 \alpha \cos^2 \alpha = 1 \Rightarrow r \cos^2 \alpha - r \sin^2 \alpha + \sin^2 \alpha \cos^2 \alpha = 1$$

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

(2)

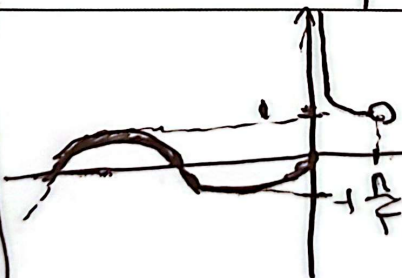
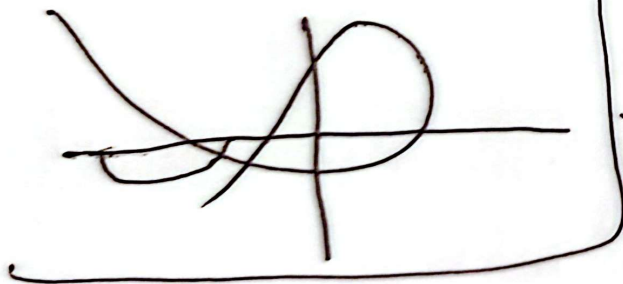
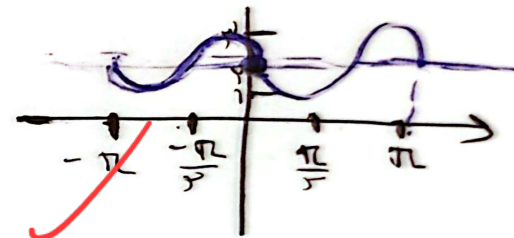
$$y = y \cos(\pi x + \frac{\pi}{2}) + 1 = -y \sin \pi x + 1$$

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



نقطه ۱ و ۲ روی محور است

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



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

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$$a + b \sin(\omega x) \cos(\omega x) \cos(\omega x) = a + \frac{b}{2} \sin(\omega x) \cos(\omega x) = a + \frac{b}{4} \sin(2\omega x)$$

$$\Rightarrow f(x) = a + \frac{b}{4} \sin(2\omega x) \Rightarrow T = \frac{2\pi}{2\omega} = \frac{\pi}{\omega} = \frac{2\pi}{\omega} \Rightarrow \omega = \frac{2\pi}{T} \quad (1)$$

(2) $a + \frac{b}{4} = 5$
 $a - \frac{b}{4} = 0$

$$\Rightarrow \boxed{a = 4} \Rightarrow f(x) = 4 + 4 \sin(2\omega x)$$

$$\Rightarrow \frac{bC}{a} = \frac{4 \times \frac{\pi}{2}}{4} = \frac{1}{2} = \omega$$

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

$$-a + C = 3$$

$$a + C = 5$$

$$\frac{2C = -2}{C = -1} \Rightarrow \boxed{C = -1} \Rightarrow f(x) = -2 \cos(2x) - 1$$

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

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

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

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

$$\Rightarrow f(1, \omega) = 0, 1, \omega + 1 = 0, 1, \omega = -1$$