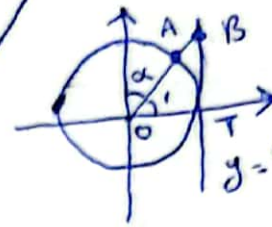


سوال 1



$$OT = 1 \rightarrow \tan 1 \rightarrow \cot \alpha$$

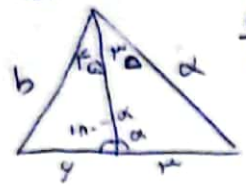
$$OT^2 + \cot^2 \alpha = OB^2 \rightarrow 1 + \cot^2 \alpha = OB^2$$

$$\sqrt{1 + \cot^2 \alpha} = \sqrt{OB^2}$$

$$\frac{1}{\sin \alpha} = \sqrt{OB^2}$$

$$\frac{1}{|\sin \alpha|} = OB \rightarrow OB = OA + BA \rightarrow OB = 1 + AB \rightarrow \frac{1 - \sin \alpha}{\sin \alpha} = AB$$

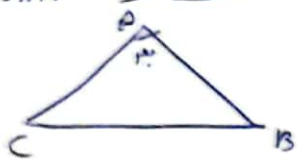
سوال 2



$$\frac{AB}{AC} \rightarrow \frac{a}{\sin \alpha} = \frac{b}{\sin \beta} \rightarrow \frac{a}{\sin \alpha} = 4$$

$$\frac{b}{\sin(\alpha + \beta)} = \frac{4}{\frac{\sin \alpha}{\frac{1}{r}}} \rightarrow \frac{b}{\sin \alpha} = 4\sqrt{r}$$

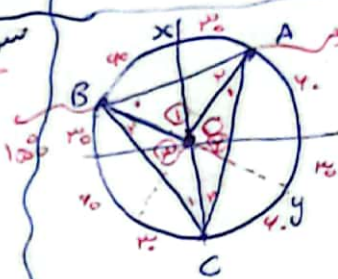
$$\frac{b}{\sin \alpha} = \frac{b}{a} = \frac{4\sqrt{r}}{4} = \sqrt{r}$$



$$S = \frac{1}{2} \times \sin 120^\circ \times AC \times AB$$

$$= \frac{1}{2} \times \frac{\sqrt{3}}{2} \times \log_{10}^{rv} \times \log_{10}^{lv} = \frac{1}{2} \times \frac{\sqrt{3}}{2} \times \log_{10}^{rv} \times \log_{10}^{lv} = \frac{\sqrt{3}}{4}$$

سوال 3



$$A_r = B_1 \rightarrow \frac{1}{r} \times \widehat{BC} = \frac{1}{r} \times 90^\circ = 45^\circ$$

$$\rightarrow O_1 = 90^\circ \rightarrow S_1 = \frac{1}{2} \times \frac{1}{r} = \frac{1}{2r}$$

$$\hat{A}_1 = \hat{C}_r \rightarrow \frac{1}{r} \times \widehat{AC} = 120^\circ \rightarrow O_r = 120^\circ$$

$$S_r \rightarrow \frac{1}{2} \times \frac{1}{r} \times \sin 120^\circ = \frac{1}{2r}$$

$$B_r = C_1 \rightarrow \frac{1}{r} \times 90^\circ = \frac{1}{r} \times \widehat{CA} = 90^\circ \rightarrow \hat{O}_r = 120^\circ \rightarrow S_r = \frac{1}{2} \times \frac{\sqrt{3}}{r} \times 120^\circ = \frac{\sqrt{3}}{r}$$

$$S_{\text{کل}} = \frac{1}{2r} + \frac{1}{2r} + \frac{\sqrt{3}}{r} = \frac{1 + \sqrt{3}}{r}$$

سوال 4

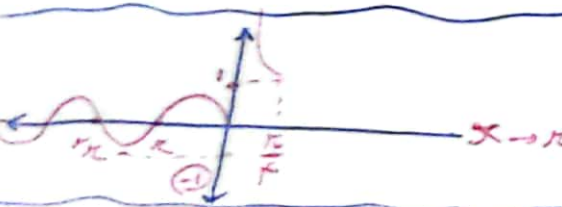
$$r \cos^2 \alpha - r \sin^2 \alpha = r (\cos^2 \alpha - \sin^2 \alpha) \rightarrow r \cos^2 \alpha - r \sin^2 \alpha$$

$$\cos^2 \alpha (r \cos^2 \alpha - 1) = 1 \rightarrow \sin^2 \alpha = 0$$

$$\cos^2 \alpha \rightarrow \cos^2 \alpha (\cos^2 \alpha + \sin^2 \alpha) = 1 \rightarrow \sin^2 \alpha = 0$$

سوال 5

$$R = [10 + \infty)$$



$$\frac{BC}{\sin 120^\circ} = \frac{1}{\sin 120^\circ} \rightarrow BC = \sqrt{3}$$

$$\frac{AC}{\sin 120^\circ} = \frac{1}{\sin 120^\circ}$$

$$\Rightarrow AC = \frac{\sqrt{3}(\sqrt{3} - \sqrt{2})}{2} = \frac{\sqrt{3}}{2} - 1$$

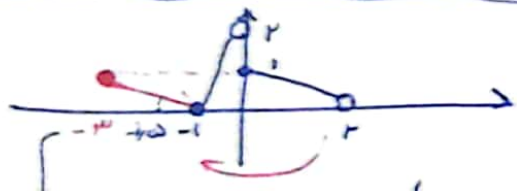
$$\frac{AB}{\sin 90^\circ} = \frac{1}{\sin 90^\circ} \rightarrow AB = \sqrt{2}$$

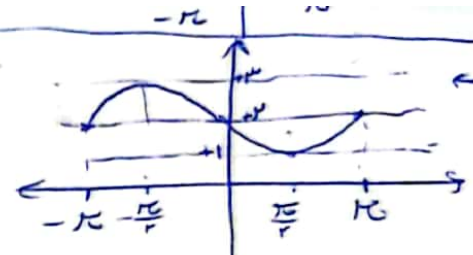
$$\sin(120^\circ - 30^\circ) = \frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} \times \frac{1}{2}$$

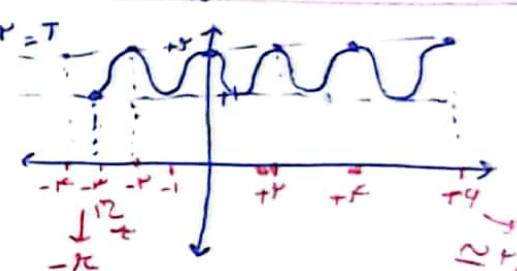
$$= \frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4}$$

$$\text{مساحت} = \frac{\sqrt{6}}{4} - 1 + \sqrt{2} - \sqrt{3}$$

$f(x) = r \cos rx - 1 = 0 \rightarrow f(x) = \frac{r}{r} \cos bx + C$ ← سوال 9
 $\rightarrow \cos rx = \frac{1}{r}$
 $\tan x + 1 = \frac{1}{\cos rx} \rightarrow \tan^r x + 1 = \frac{1}{\cos rx}$ 9
 $\rightarrow \tan^r x = 1 \rightarrow (\tan x) = r/r$


 $f(-1/r, 0) = f(-1, 0)$ ← سوال 10
 $-\frac{1}{r}x - \frac{1}{r} = \frac{1}{r} \rightarrow -\frac{1}{r}x + b = 0 \rightarrow b = -\frac{1}{r}$
 $-1/r x - 1/r - 1/r = \frac{1}{r}$

$y = -\sin^2 x + r \rightarrow \frac{r\pi}{r} = \pi = T$ ← سوال 9


$y = r \cos(x + \frac{1}{r})\pi + 1 \rightarrow \frac{r\pi}{\pi} = r = T$


$f(x) = a + b \sin(cx) \cos(cx) \cos(rcx)$ ← سوال 11
 $\frac{b}{r} \sin(rcx) \rightarrow \frac{b}{r} \sin(kcx) + a$
 $\frac{r\pi}{r} - \frac{r\pi}{10} = \frac{r\pi}{10} = \frac{r\pi}{\omega} = \frac{r\pi}{rc} \rightarrow \boxed{C = \frac{\omega}{r}}$
 $\max = \frac{b}{r} + a = r$
 $\min = -\frac{b}{r} + a = 0 \rightarrow \boxed{a = r} \quad \boxed{b = 1}$
 $\frac{\omega \times 1}{r} = \omega$