

از A عمودی بر محور x رسم کرده رابی عمود را H می‌نامیم.

$$AH = \sin(90^\circ - \alpha) = \cos \alpha$$

$$BT = \tan(90^\circ - \alpha) = \cot \alpha$$

$$\text{نسبت: } \frac{OA}{OB} = \frac{AH}{BT} \Rightarrow \frac{1}{1+AB} = \frac{\cos \alpha}{\cot \alpha} = \sin \alpha \Rightarrow AB = \frac{1 - \sin \alpha}{\sin \alpha}$$

$$\left. \begin{aligned} \frac{BD}{\sin 45^\circ} = \frac{AB}{\sin(110^\circ - \alpha)} &\Rightarrow \frac{4}{\frac{\sqrt{2}}{2}} = \frac{AB}{\sin \alpha} \\ \frac{AC}{\sin \alpha} = \frac{DC}{\sin 15^\circ} &\Rightarrow \frac{12}{\frac{1}{2}} = \frac{AC}{\sin \alpha} \end{aligned} \right\} \frac{AB}{AC} = \sqrt{2}$$

$$\hat{AOB} = 90^\circ \quad \hat{AOC} = 150^\circ \quad \hat{BOC} = 110^\circ$$

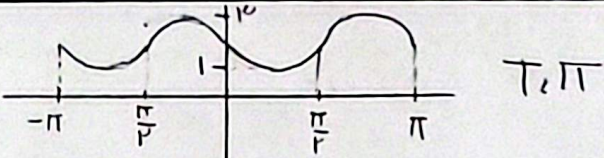
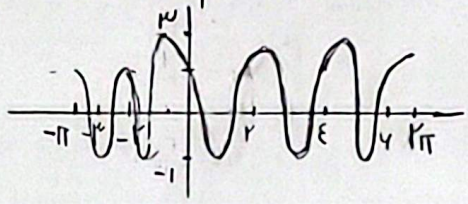
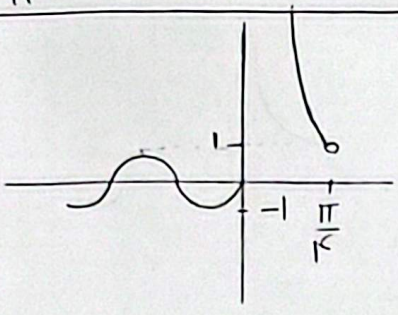
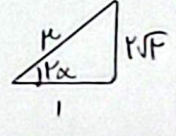
$$\begin{aligned} S_{ABC} &= S_{AOC} + S_{AOB} + S_{BOC} = \frac{1}{2} \times 1 \times 1 \times \sin 150^\circ + \frac{1}{2} \times 1 \times 1 \times \sin 90^\circ \\ &\Rightarrow + \frac{1}{2} \times 1 \times 1 \times \sin 110^\circ = \frac{1}{2} + \frac{1}{2} + \frac{\sqrt{3}}{2} = \frac{1+\sqrt{3}}{2} \quad \underline{S} = 1 + \sqrt{3} \\ AB &= \sqrt{1^2 + 1^2} = \sqrt{2} \\ \hat{BOC} = 110^\circ &\Rightarrow BC = BO\sqrt{2} = \sqrt{2} \quad AC^2 = 1 + 1 - 2\cos 150^\circ = 2 - \sqrt{3} \end{aligned}$$

$$S = \frac{1}{2} \times \sin 150^\circ \times (1 \times \log_{12} 12) \times 12 \log_{12} 12 = 12$$

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

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

$$\cos^2 x = 1 \Rightarrow \sin^2 x = 0$$

الف) $y = -\sin kx + 1$		6
ب) $y = 2 \cos(\pi(x + \frac{1}{\pi})) + 1$ $T = \frac{2\pi}{\pi} = 2$		7
	$R_f = [-1, +\infty)$	8
$f(x) = a + \frac{b}{k} \times \sin(kcx)$ $\text{Max}(f) = a - \frac{b}{k} = 1$ $\text{Min}(f) = a + \frac{b}{k} = 0$ $a = 2 \quad b = -1$	$T = \frac{\pi}{\frac{1}{2}} = 2\pi$ $\Rightarrow C = \omega$ بأنه به اطراف اولین max تابع: $b < 0$ $\frac{bc}{a} = \frac{-1 \times \omega}{2} = -\frac{\omega}{2}$	9
$C = \frac{\text{Max} + \text{Min}}{2} = -1$ $\text{Max}(f) = C - a = 2 \Rightarrow a = -4$ $T = \pi = \frac{2\pi}{b} \Rightarrow b = 2$	بأنه به مندرج $a < 0$ $f(x) = -4 \cos kx - 1 = 0$ $\cos kx = -\frac{1}{4}$ $ \tan kx = \sqrt{15}$ 	10
$f(-\sqrt{2}/2) = f(1/\sqrt{2})$ $\Rightarrow f(1/\sqrt{2}) = -\frac{\sqrt{2}}{k} + 1 = \frac{1}{k}$	$0 \leq x \leq 2 \Rightarrow f(x) = -\frac{1}{\sqrt{2}}x + 1$	