

$$BT = \tan\left(\frac{\pi}{p} - \alpha\right) = \cot \alpha \quad AH = \cos \alpha \quad OA = 1 \quad \xrightarrow{\text{تالس}} \frac{OA}{OB} = \frac{AH}{BT} \quad \frac{1}{1+AB} = \frac{\cos \alpha}{\cot \alpha} = \sin \alpha$$

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

$$\sin \alpha = \sin(\pi - \alpha) \quad \text{قضیه سینوسها: } \frac{r}{\sqrt{p}} = \frac{AB}{\sin \alpha} \quad \frac{r}{\frac{1}{p}} = \frac{AC}{\sin \alpha} \rightarrow \frac{AB}{AC} = \frac{\frac{r}{\sqrt{p}}}{\frac{r}{p}} = \sqrt{p}$$

$$\hat{O}_1 = 90^\circ \quad \hat{O}_p = 120^\circ \rightarrow \hat{AOB} = 90^\circ \quad \hat{AOC} = 140^\circ \quad \hat{BOC} = 120^\circ$$

$$\text{الف) } S_{\text{کل}} = S_{AOB} + S_{AOC} + S_{BOC} \quad S = \left(\frac{1 \times 1}{2}\right) + \left(\frac{1}{2} \times 1 \times 1 \times \frac{1}{p}\right) + \left(\frac{1}{2} \times 1 \times 1 \times \frac{\sqrt{p}}{p}\right) = \frac{1}{2} + \frac{1}{2p} + \frac{\sqrt{p}}{2p} = \frac{p + \sqrt{p}}{2p}$$

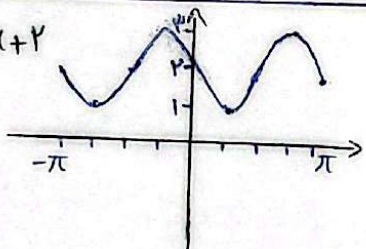
$$\text{ب) } AB = \sqrt{1+1} = \sqrt{2} \quad AC' = 1+1 - 2 \times 1 \times \cos 140^\circ = 2 + \sqrt{3} \quad AC = \sqrt{2 + \sqrt{3}} \quad \checkmark$$

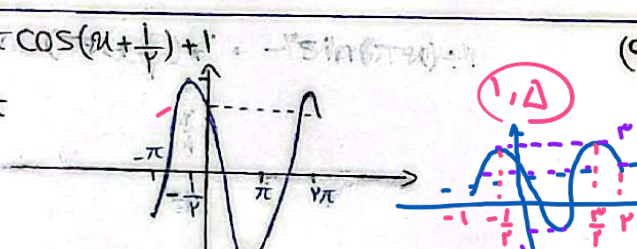
$$BC' = 1+1 - 2 \times 1 \times \cos 120^\circ = 3 \quad BC = \sqrt{3} \quad P = \sqrt{2} + \sqrt{2 + \sqrt{3}} + \sqrt{3} \quad \checkmark$$

$$S = \frac{1}{p} \times AB \times AC \times \sin 120^\circ \quad S = \frac{1}{p} \times \log_p^{\sqrt{2}} \times \log_p^{\sqrt{3}} \times \frac{1}{p} = \frac{1}{p^2} \times 12 = 3 \quad \checkmark$$

$$f(\cos \alpha) = 1 \quad r \cos^2 \alpha - \cos^2 \alpha - \sin^2 \alpha (r \sin^2 \alpha - 1) = 1 \quad \cos^2 \alpha (r \cos^2 \alpha - 1) - \sin^2 \alpha (-\cos^2 \alpha) = 1$$

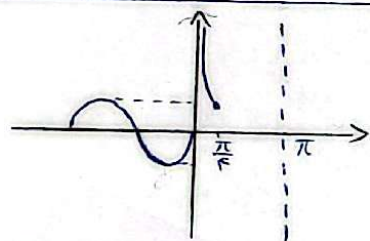
$$\cos^2 \alpha (\cos^2 \alpha + \sin^2 \alpha) = 1 \rightarrow \cos^2 \alpha = 1 \quad \sin^2 \alpha = 0 \quad \checkmark$$

$$\text{الف) } y = -\sin 2x + 2 \quad T = \frac{2\pi}{p} = \pi$$


$$\text{ب) } y = 2\pi \cos\left(x + \frac{1}{p}\right) + 1 \quad T = \frac{2\pi}{1} = 2\pi$$


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

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



$$\xrightarrow{\text{شکل}} R_f = [-1, +\infty)$$

$$f(x) = a + \frac{b}{x} \sin(fc x) \quad T = \frac{2\pi}{10} = \frac{2\pi}{\omega} \rightarrow \frac{2\pi}{|fc|} = \frac{2\pi}{\omega} \quad c > 0 \rightarrow c = \frac{\omega}{f}$$

$$\left|\frac{b}{f}\right| + a = 5 \quad \left|\frac{b}{f}\right| = 2 \quad |b| = 4 \quad \frac{ab > 0}{a} \rightarrow b = 4 \quad \frac{bc}{a} = \frac{4 \times \frac{\omega}{f}}{4} = \omega$$

$$-\left|\frac{b}{f}\right| + a = 0 \quad a = 3$$

$$T = \pi \quad \frac{2\pi}{|b|} = \pi \quad |b| = 2 \quad \xrightarrow{\text{در کسینوس علامت مهم نیست}} b = 2 \quad \xrightarrow{\text{شکل}} a = -3, c = -1 \quad f(x) = 0$$

$$-3 \cos 2x - 1 = 0 \quad \cos 2x = -\frac{1}{3} \quad \tan 2x = \frac{\sqrt{1 - \left(-\frac{1}{3}\right)^2}}{-\frac{1}{3}} = -\sqrt{8}$$

$$f(-3f, \omega) = f(-3f - 0, \omega) = f(1, \omega) \quad f(x) = \begin{cases} 2x + 2 & -1 \leq x \leq 0 \\ -\frac{1}{p}x + 1 & 0 \leq x \leq p \end{cases}$$

$$f(1, \omega) = -\frac{1}{p} \left(\frac{p}{p}\right) + 1 = \frac{1}{p}$$