

$$AB = OB - OA = OB - 1 \quad \tan \hat{O}_1 = \cot(90 - \hat{O}_1) = \cot \alpha$$

(1)

$$OB = \sqrt{OT^2 + BT^2} = \sqrt{1 + \tan^2 \hat{O}_1} = \sqrt{1 + \cot^2 \alpha} = \sqrt{\frac{1}{\sin^2 \alpha}} = \frac{1}{\sin \alpha}$$

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

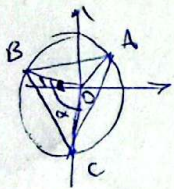
بقیہ سہجیوں : $\frac{ABD}{\sin 40^\circ} = \frac{AB}{\sin(110 - \alpha)} = \frac{4}{\frac{\sqrt{3}}{2}} \rightarrow \frac{AB}{\sin \alpha} = 8\sqrt{2}$

بقیہ سہجیوں : $\frac{DC}{\sin 30^\circ} = \frac{AC}{\sin \alpha} = \frac{4}{\frac{1}{2}} \rightarrow \frac{AC}{\sin \alpha} = 8$

$$\left. \begin{array}{l} \frac{AB}{\sin \alpha} = 8\sqrt{2} \\ \frac{AC}{\sin \alpha} = 8 \end{array} \right\} \div \frac{AB}{AC} = \frac{8\sqrt{2}}{8} = \sqrt{2}$$

$$A\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right) \quad B\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right) \quad C(0, -1)$$

(2)



$$\hat{O}_1 = 40^\circ \quad \alpha = 90 + 30 = 120^\circ \rightarrow \hat{BC} = 110^\circ$$

$$\angle A = \frac{1}{2} \times 120^\circ = 60^\circ$$

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

$$AC = \sqrt{\left(\frac{1}{2}\right)^2 + \left(\frac{1+\sqrt{3}}{2}\right)^2} = \sqrt{1+\sqrt{3}}$$

$$BC = \sqrt{\left(\frac{\sqrt{3}}{2}\right)^2 + \left(\frac{1}{2}\right)^2} = \sqrt{2}$$

$$S = \frac{AB \times AC \times \sin \hat{A}}{2} = \frac{\sqrt{2} \times \sqrt{1+\sqrt{3}} \times \frac{\sqrt{3}}{2}}{2} = \frac{\sqrt{3}}{2} (1 + \sqrt{3})$$

(3)

$$\text{b.e } 2P = \sqrt{2} + \sqrt{2} + \sqrt{1+\sqrt{3}}$$

(4)

$$S = \frac{1}{2} \times AC \times AB \times \sin \hat{A} = \frac{1}{2} \log_2 14 \log_2 14 = \log_2 2 \times 2 \log_2 2 = 2$$

(5)

$$x - \cos \alpha = 0 \rightarrow x = \cos \alpha$$

(6)

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

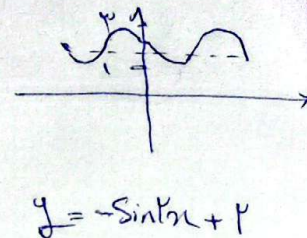
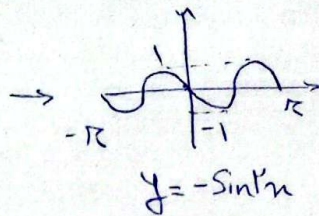
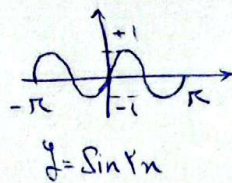
$$\rightarrow \cos^2 \alpha (2 \cos^2 \alpha - 1) = \cos^2 \alpha = 1$$

$$\sin^2 \alpha = \sqrt{1 - \cos^2 \alpha} = \sqrt{1 - 1} = 0$$

coll) $y = -r \sin n \cos n + r \quad [-\pi, \pi]$

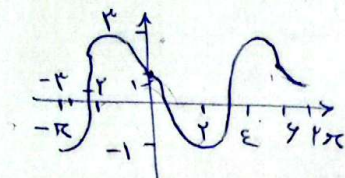
$y = -\sin n + r$

$T = \frac{r\pi}{|r|} = \pi$

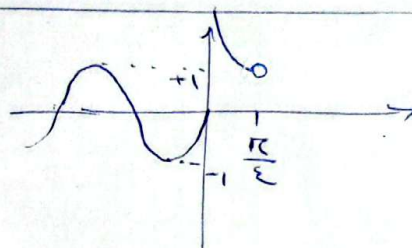


b) $y = r \cos(n + \frac{1}{r})\pi + 1 = r \cos(\frac{\pi n}{r} + \frac{\pi}{r}) + 1 = -r \sin(\pi n) + 1 \quad [-\pi, \pi]$

$T = \frac{r\pi}{|r|} = r$



$f(n) = \begin{cases} \cot n & ; -\pi < n < \frac{\pi}{2} \\ \sin n & ; n \leq -\pi \end{cases}$



$Rf = \dots [-1, +\infty)$

$\cot \frac{\pi}{2} = 1$

$\lim_{n \rightarrow 0} \cot n = +\infty$

$f(n) = a + b \sin(cn) \cos(cn) \cos(\pi cn) = a + \frac{b}{r} \sin(\pi cn) \cos(\pi cn) = a + \frac{b}{2} \sin(2\pi cn)$

$T = \frac{r\pi}{\pi c} = \frac{r}{c} = \frac{\pi}{10} = \frac{r\pi}{a} \rightarrow \pi c = a \rightarrow c = \frac{a}{r}$

$\max f(n) = 2 \rightarrow \frac{a+b}{r} = 2 \rightarrow \frac{b}{r} = 2 - \frac{a}{r} \rightarrow \frac{b}{c} = 2 - \frac{a}{r} \rightarrow \frac{b}{c} = 1$

$\frac{bc}{a} = \frac{1 \times a}{r} = \frac{a}{r}$

$f(n) = a \cos bn + c$

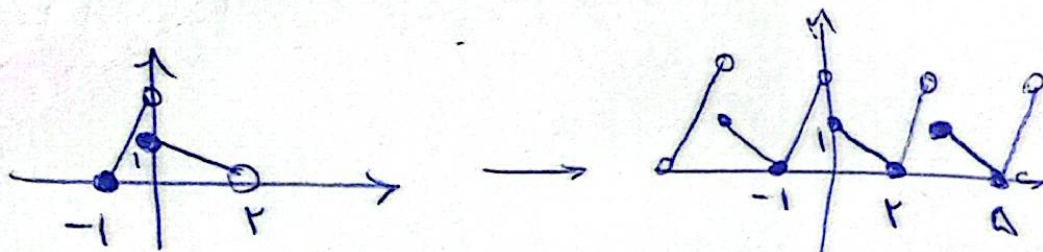
$T = \frac{r\pi}{b} = \pi \rightarrow b = r$ $\max f(n) = r$ $\frac{r+c}{r} = r \rightarrow a = r$ $\rightarrow c = -1$

$f(n) = r \cos rn - 1 = r \cos rn - 1$

$r \cos \pi - 1 = 0 \rightarrow \cos \pi = \frac{1}{r}$

$|\sin \pi| = \sqrt{1 - \frac{1}{r^2}} = \frac{\sqrt{r^2 - 1}}{r}$

$|\tan \pi| = \frac{\frac{\sqrt{r^2 - 1}}{r}}{\frac{1}{r}} = \sqrt{r^2 - 1}$



چون دوره تناوب ۲ است. $f(-\frac{3}{2}) = 1$ برابر با f در 1 است که از $-\frac{3}{2}$ و $3k$ به دست می آید.

$$f(-\frac{3}{2}) = f(1)$$

$$m = -\frac{1}{2} \rightarrow 0 \leq x < 2 \Rightarrow f(x) = -\frac{1}{2}x + 1 \rightarrow f(1) = -\frac{1}{2} \times \frac{2}{2} + 1 = \frac{1}{2}$$