

۱۴، ۷۵

سوال (۱)

۲

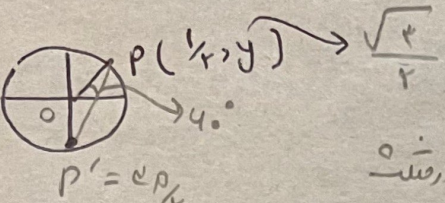
$$\frac{a \sin \frac{\pi}{4} + b \cos \frac{\pi}{4}}{a \sin \frac{11\pi}{4} + b \cos \frac{\pi}{4}} = \tan \frac{\pi}{4}$$

$$\frac{b}{a} = ?$$

$$\frac{(ax - \frac{\sqrt{2}}{2}) + (bx - \frac{\sqrt{2}}{2})}{(ax - \frac{1}{2}) + (bx - \frac{1}{2})} = -\frac{\sqrt{2}}{2} \Rightarrow \frac{(-\frac{\sqrt{2}}{2}a) + (-\frac{\sqrt{2}}{2}b)}{(-\frac{1}{2}a) + (-\frac{1}{2}b)} = \frac{-\frac{\sqrt{2}}{2}(a+b)}{\frac{1}{2}(b-a)} = -\frac{\sqrt{2}}{2}$$

$$\times \frac{2}{\sqrt{2}} \Rightarrow \sqrt{2}(a+b) = \frac{\sqrt{2}}{2}(b-a) \Rightarrow 2a + 2b = b - a \Rightarrow 3a = -2b \Rightarrow \frac{b}{a} = -\frac{3}{2}$$

$$\Rightarrow \boxed{\frac{b}{a} = -\frac{3}{2}} \quad \checkmark$$



$$P(\frac{1}{2}, \frac{\sqrt{2}}{2}), P'(0, -1)$$

$$90^\circ + 210^\circ = 270^\circ = \frac{3\pi}{2}$$

$$P'(0, -1)$$

$$\left. \begin{array}{l} \text{درصد} \\ \text{OPR} \end{array} \right\} \begin{array}{l} 260 - 210 = 150^\circ \\ 180 - 150 = 30^\circ \\ 30 \div 2 = 15^\circ \end{array} \Rightarrow \text{C} 150^\circ = -\frac{5\pi}{6}$$

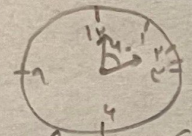
$$\text{ضلع } PP' = \sqrt{(x-x')^2 + (y-y')^2}$$

$$\Rightarrow PP' = \sqrt{2 - \sqrt{2}} \Rightarrow \boxed{\frac{1}{\sqrt{2}} = 1 + 1 + \sqrt{2 - \sqrt{2}}} \quad (PP')^2 = 1^2 + 1^2 - 2(1)(1)(-\frac{\sqrt{2}}{2}) = 2 + \sqrt{2}$$

$$2 \times 30^\circ = 60^\circ = \frac{\pi}{3}$$

$$\frac{\pi}{3} + \frac{\pi}{9} = \frac{3\pi + \pi}{9} = \frac{4\pi}{9}$$

$$\frac{D}{180} = \frac{R}{n} \Rightarrow \frac{D}{180} = \frac{4\pi}{9} \Rightarrow D = 4 \times 180^\circ \Rightarrow D = 720^\circ$$



$$30^\circ \sim \frac{\pi}{6} = 30^\circ$$

$$\Rightarrow 2 \times 4 = 8 \rightarrow 2 = 2$$

دقت ۲ ساعت یعنی عقرب ساعت ۲ و دقیقه ۲۰ ساعت ۱۲:۲۰
دقت دقیقه ۲۰ ساعت ۱۲:۲۰ یعنی ۱۲:۲۰ + ۲۰ = ۱۲:۴۰

۲:۴۰

سوال (۴)

$$|\frac{11M}{2} - 3.14| = 2 \Rightarrow \frac{11M}{2} = 3.14 \pm 2$$

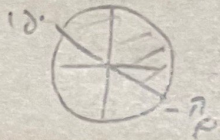
$$\frac{11M}{2} - 3.14 = 2 \Rightarrow \frac{11M}{2} = 5.14 \Rightarrow M = 2$$

$$\frac{11M}{2} - 3.14 = -2 \Rightarrow M = \frac{1.14}{11}$$

مثال ٥

$$-\frac{\pi}{4} < x \leq \frac{2\pi}{4} \quad \sin x = \frac{m-r}{\omega} \Rightarrow -\frac{1}{4} \leq \sin x \leq 1 \Rightarrow$$

$$\left. \begin{array}{l} -\frac{\pi}{4} < x \leq \frac{2\pi}{4} \\ -\frac{\pi}{4} < x \leq \frac{2\pi}{4} \end{array} \right\}$$



$$-\frac{1}{4} < \frac{m-r}{\omega} \leq 1 \Rightarrow -\frac{\omega}{4} < m-r \leq \omega$$

$$\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\} \rightarrow \left[\frac{-\omega}{4}, \omega \right] \Rightarrow \frac{-\omega}{4} < m-r \leq \omega \Rightarrow -\frac{\omega}{4} \leq m \leq \frac{11\omega}{4}$$

$$\tan 10^\circ = 0.176$$

مثال ٦

$$\frac{\sin(10^\circ) + k \cos(10^\circ)}{\cos(10^\circ) + r \sin(10^\circ)} = r \Rightarrow \frac{\cos 10^\circ + k(-\sin 10^\circ)}{\cos 10^\circ + r(-\sin 10^\circ)} = r$$

$$k = ?$$

$$\div \cos 10^\circ \Rightarrow \frac{1 + k(-\tan 10^\circ)}{1 + r(-\tan 10^\circ)} = \frac{1 - k \tan 10^\circ}{1 - r \tan 10^\circ} = r \Rightarrow \frac{C_{10} - k S_{10}}{C_{10} - r S_{10}} = r$$

$$\frac{1 - 0.176k}{1 - 0.176r} = r \Rightarrow 1 - 0.176k = r(1 - 0.176r) \Rightarrow 1 - 0.176k = r - 0.031r^2 \Rightarrow 0.031r^2 - 0.176k + 1 - r = 0$$

$$k = \frac{-0.176}{0.031} = -5.677 \Rightarrow \boxed{k = -5.677}$$

مثال ٧

$$\cos x = r \cos y$$

$$\tan\left(\frac{\pi}{4} - x\right) = \cot(\pi - x)$$

$$\frac{1 - \cos x}{1 + \cos x} = r$$

$$\frac{\cot(\frac{\pi}{4} - x) + r \tan(\pi - x)}{\cot(\frac{\pi}{4} - x) + r \tan(\pi - x)} = ?$$

$$\frac{\cot x + \cot x}{\tan x - r \tan x} = \frac{r \cot x}{- \tan x} = -r \cos x \quad \frac{1 - \cos x}{1 + \cos x} = r \Rightarrow$$

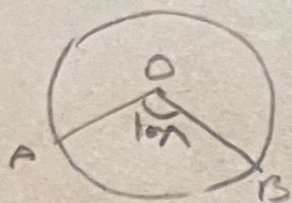
$$r(1 + \cos x) = 1 - \cos x \Rightarrow r + r \cos x = 1 - \cos x \Rightarrow r \cos x = -1 \Rightarrow$$

$$\cos x = -\frac{1}{r} \Rightarrow \cos x = -\frac{1}{r} \Rightarrow \boxed{\cos x = -\frac{1}{r}}$$

$$1 - \cos x = r + r \cos x \Rightarrow \cos x = -\frac{1}{r}$$

$$\frac{\cot x + \cot x}{\tan x - r \tan x} = \frac{r \cot x}{- \tan x} = -r \cos x$$

$$\cot x = -\frac{1}{r \cos x} \Rightarrow -r \cos x = -\frac{1}{r \cos x} \Rightarrow \boxed{\cos x = -\frac{1}{r}}$$



$$|AB| = 1 \cdot AR$$

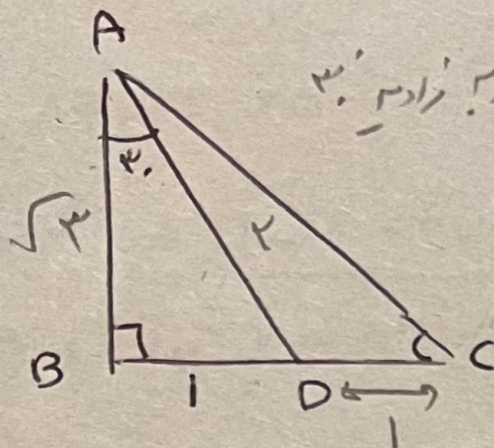


$$|A'B'| = \frac{90}{1} R'$$

$$|AB| = |A'B'| \Rightarrow 1 \cdot AR = 144 R' \Rightarrow \frac{R}{R'} = \frac{144}{1} = \frac{4}{1} = 4$$

$$\frac{R^2}{R'^2} = \left(\frac{4}{1}\right)^2 = \frac{16}{1}$$

$$\frac{D}{144} = \frac{R}{16} \Rightarrow \frac{D}{144} = \frac{90}{16} \Rightarrow \frac{D}{144} = \frac{9}{16} \Rightarrow D = 144 \cdot \frac{9}{16} = 81$$



$$\text{ضلع دو برابر زیادہ} = \text{نصف وتر} \Rightarrow AD = 2$$

$$AD^2 = BD^2 + AB^2 \Rightarrow 4 = 1 + AB^2 \Rightarrow AB = \sqrt{3}$$

$$S_{\Delta ABC} = \sqrt{3} = \frac{AB \times BC}{2} = \sqrt{3} \Rightarrow AB \times BC = 2\sqrt{3}$$

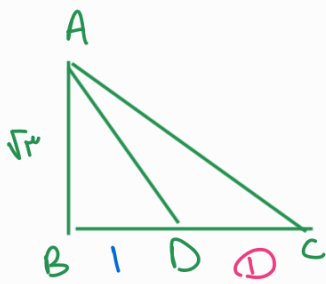
$$AC^2 = AB^2 + BC^2 = 3 + 4 = 7$$

$$AC = \sqrt{7}$$

سوال ۸

سوال ۹

۱,۲۵



$$S_{ABC} = \sqrt{r}$$

$$\frac{AB \times BC}{r} = \frac{\sqrt{r} \times DC}{r} = \sqrt{r} \rightarrow BC = r \rightarrow DC = 1$$

$$\rightarrow \sin \theta = r \times \frac{\sqrt{r}}{\sqrt{v}} \times \frac{r}{\sqrt{v}} = \frac{r\sqrt{r}}{v}$$

$$AN = AM \rightarrow AM^2 = (AB^2) + (BM^2) = r^2 + r^2 = 1r \rightarrow AM = \sqrt{1r}$$

$$S_{ADN} = S_{ABM} = \frac{r \times r}{r} = r, \quad S_{MCN} = \frac{1 \times 1}{r}$$

$$\cancel{S_{ADN}} + \cancel{S_{ABM}} + \cancel{S_{MCN}} + S_{AMN} = \cancel{S_{ABCD}} \rightarrow$$

$$\frac{1}{r} \times \sqrt{1r} \times \sqrt{1r} \times \sin \theta = \frac{r}{r}$$

$$\sin \theta = \frac{r}{1r}$$

PA

