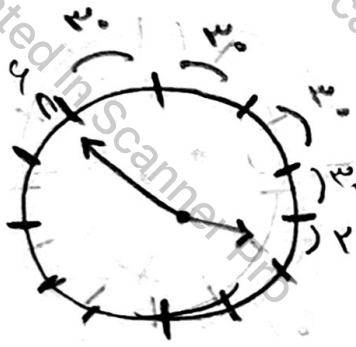


یسنه قمرانی کلک ۱۹ یجیصنه (متران)

①

(الف)



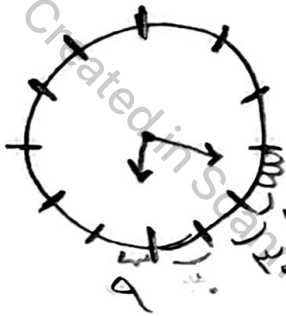
$$= 27 + 9 + 4(30) = 153$$

$$\frac{3}{2} \times 27 \rightarrow 40.5$$

(ب)

$$\alpha = |30h - 515M| \rightarrow |30 \times 3 - 515 \times 54| = |1 - 27.5|$$

$$= 27.5 \rightarrow 39. - 27.5 = 11.5^\circ$$



$$4 \times 11 \rightarrow \frac{11}{2} = 5.5$$

$$\alpha = 12 + 2(30) + 9 = 111^\circ$$

(الف)

$$\alpha = |30h - 515M| = |30(4) - 515(11)|$$

$$= |111| = 111^\circ$$

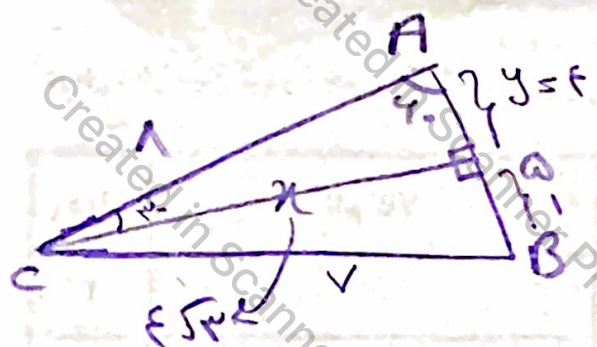
$$\alpha = \frac{\pi}{4} \quad R = 4 \text{ cm}$$

$$S = \frac{\alpha}{r} R^2 \rightarrow \frac{\pi}{4} \times 4 = \frac{\pi}{4} \times 4 = \frac{\pi}{4}$$

(الف)

$$|AB| = \alpha R \rightarrow \frac{\pi}{4} \times 4 = \frac{\pi}{4} \times 4 = \frac{\pi}{4}$$

(ب)



$$S = \frac{1}{2} \times AC \times BC \times \sin A$$

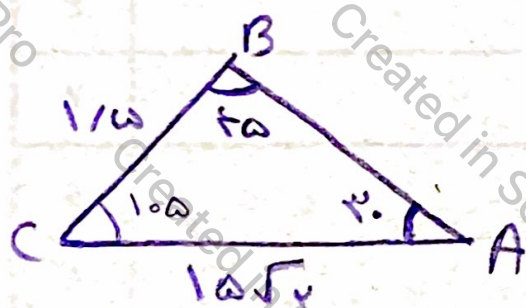
(الف)

$$S = \frac{1}{2} \times 1 \times 1 \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{4}$$

$$x = \frac{\sqrt{3}}{2} \times 1 = \frac{\sqrt{3}}{2} \rightarrow y = \frac{1}{2} \times 1 = \frac{1}{2}$$

$$CB = \sqrt{1 + \frac{1}{4}} = \sqrt{\frac{5}{4}} = \frac{\sqrt{5}}{2}$$

$$P = \omega + \lambda + \nu = 40$$



$$\hat{A} + \hat{B} + \hat{C} = 180^\circ \rightarrow A = 40^\circ$$

$$\frac{BC}{\sin A} = \frac{AC}{\sin B} \rightarrow \frac{1}{\frac{1}{2}} = \frac{10\sqrt{2}}{\sin B}$$

$$2 \sin B = 10\sqrt{2}$$

$$\sin B = \frac{5\sqrt{2}}{1} \rightarrow \begin{cases} B = 45^\circ \\ B = 135^\circ \end{cases}$$

$$B = 40^\circ \rightarrow \frac{\pi}{2}$$

$$C = 100^\circ = \frac{\sqrt{2}}{2}$$

$$\frac{\tan(\pi - \alpha) + r \tan(\pi + \alpha)}{\tan(\pi - \alpha) - \tan(\pi + \alpha)} = \frac{-\tan(\alpha) + r \tan(\alpha)}{-\tan(\alpha) - (+\tan(\alpha))}$$

$$\Rightarrow \frac{r \tan(\alpha)}{-r \tan(\alpha)} = -1$$

$$\Rightarrow \frac{r \tan(\alpha)}{-r \tan(\alpha)} = -1$$

✓

$$A = \frac{r \tan 40^\circ + \tan 1.0}{r \tan 190^\circ - \tan 100^\circ} = \frac{r \tan(90^\circ - 10^\circ) + \tan(90^\circ + 10^\circ)}{r \tan(180^\circ - 10^\circ) - \tan(270^\circ - 10^\circ)}$$

$$\frac{\pi}{12} \times \frac{100}{\pi} = 10 \Rightarrow \frac{r \cot(10^\circ) - \cot(10^\circ)}{r \tan(10^\circ) + \cot(10^\circ)} = \frac{\cot(10^\circ)}{-r \tan(10^\circ) - \cot(10^\circ)}$$

$$\tan \frac{\pi}{12} = \alpha$$

$$\tan 10^\circ = \alpha \rightarrow \cot 10^\circ = \frac{1}{\alpha}$$

$$\Rightarrow \frac{\frac{1}{\alpha}}{-r\alpha + \frac{1}{\alpha}} = \frac{\frac{1}{\alpha}}{\frac{-r\alpha^2 + 1}{\alpha}} = \frac{1}{-r\alpha^2 + 1}$$

$$= \frac{-1}{r\alpha^2 + 1}$$

②

$$\frac{\sin^2 \theta \cos^2 \theta + \sin^2 \theta \cos^2 \theta - \sin^2 \theta \cos^2 \theta}{(\sin^2 \theta \cos^2 \theta) + (\sin^2 \theta \cos^2 \theta)} = \frac{r(\sin^2 \theta \cos^2 \theta)}{\sin^2 \theta - \cos^2 \theta} = r$$

$$\frac{(\sin^2 \theta \cos^2 \theta)(\sin^2 \theta \cos^2 \theta)}{\sin^2 \theta - \cos^2 \theta}$$

$$\sin^2 \theta = 1 - \cos^2 \theta$$

$$1 + \tan^2 \theta = \frac{1}{\cos^2 \theta} \rightarrow 1 + \tan^2 \theta = \frac{1}{\frac{1}{9}}$$

$$1 + \tan^2 \theta = 9 \rightarrow \tan^2 \theta = 8$$

$$r(\sin^2 \theta - \cos^2 \theta) = r$$

$$\sin^2 \theta - \cos^2 \theta = \frac{r}{r} = 1$$

$$1 - \cos^2 \theta - \cos^2 \theta = 1$$

$$1 - 2\cos^2 \theta = 1$$

$$-2\cos^2 \theta = 0$$

$$\cos^2 \theta = 0$$

$$\cos \theta = 0$$

9

$$\frac{\sin^2 - \sqrt{2} \cos^2 + 1}{\sin^2 + \sqrt{2} \cos^2 - 1} = \sqrt{2} \rightarrow \frac{1 - \cos^2 - \sqrt{2} \cos^2 + 1}{\sqrt{2} \cos^2 + \sqrt{2} \cos^2 - 1} = \frac{\sqrt{2} - \sqrt{2} \cos^2}{\cos^2} = \sqrt{2}$$

$$\sqrt{2} \cos^2 = \sqrt{2} - \sqrt{2} \cos^2 \rightarrow \sqrt{2} \cos^2 = \sqrt{2} \rightarrow \cos^2 = \frac{\sqrt{2}}{\sqrt{2}}$$

$$1 + \tan^2 = \frac{1}{\cos^2} \Rightarrow 1 + \tan^2 = \frac{\sqrt{2}}{\sqrt{2}} \Rightarrow \tan^2 = \frac{\sqrt{2} - \sqrt{2}}{\sqrt{2}} = \boxed{\frac{1}{2}}$$

10

$$\text{الف) } \cos(4\sqrt{2}/10) \rightarrow \cos^2 = \frac{1 + \cos^2 \alpha}{2} \rightarrow \cos^2 4\sqrt{2}/10 = \frac{1 + \cos^2 \alpha}{2}$$

$$= \frac{1 + \frac{\sqrt{2}}{2}}{2} = \frac{\frac{2 + \sqrt{2}}{2}}{2} = \frac{2 + \sqrt{2}}{4} \rightarrow \cos 4\sqrt{2}/10 = \boxed{\frac{\sqrt{2 + \sqrt{2}}}{2}}$$

$$\text{ب) } \sin(4\sqrt{2}/10) \rightarrow \sin^2 = \frac{1 - \cos^2 \alpha}{2} \rightarrow \sin^2 4\sqrt{2}/10 = \frac{1 - \cos^2 \alpha}{2}$$

$$= \frac{1 - (\frac{\sqrt{2}}{2})}{2} = \frac{\frac{2 - \sqrt{2}}{2}}{2} = \frac{2 - \sqrt{2}}{4} \rightarrow \sin 4\sqrt{2}/10 = \boxed{\frac{\sqrt{2 - \sqrt{2}}}{2}}$$