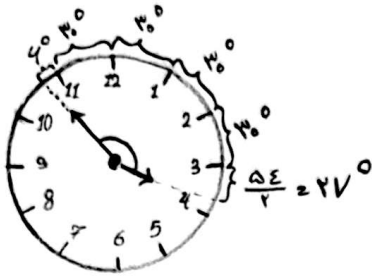


(۱)



$$30 + 30 + 30 + 30 + 27 + 4 = 153^\circ$$

$\alpha < 180^\circ$

(الف)

$$\alpha = |\Delta, \Delta m - 30h| = |(\Delta, \Delta \times \Delta \epsilon) - (30 \times 3)| = 20V^\circ$$

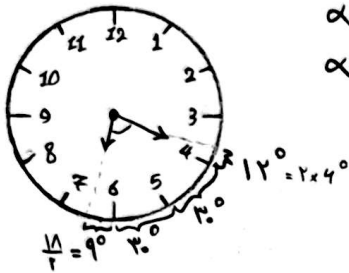
$\alpha > 180^\circ$

(ب)

$$34^\circ - 20V^\circ = 153^\circ$$

$\alpha < 180^\circ$

(۲)



$$\alpha < 180^\circ \rightarrow 9 + 30 + 30 + 12 = 111^\circ$$

(الف)

$$\alpha > 180^\circ \rightarrow 34^\circ - 111^\circ = 279^\circ$$

$$\alpha = |\Delta, \Delta m - 30h| = |(\Delta, \Delta \times 18) - (3 \times 4)| = 111^\circ$$

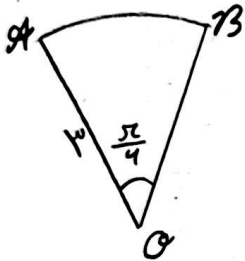
$\alpha < 180^\circ$

(ب)

$$34^\circ - 111^\circ = 279^\circ$$

$\alpha > 180^\circ$

(۳)



$$L = \frac{\alpha}{r} R^2 = \frac{\pi}{4} \times 3^2 = \frac{\pi}{12} \times 9 = \frac{9\pi}{12} = \frac{3\pi}{4}$$

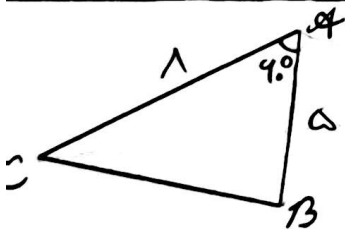
(الف)

$$P_{AOB} = L + 2R = \frac{\pi}{4} + (2 \times 3) = \frac{\pi}{4} + 4 = \frac{12 + \pi}{4}$$

(ب)

$$L = R \times \alpha = \frac{3\pi}{4} = \frac{\pi}{4}$$

(۴)



$$L_{ABC} = \frac{1}{2} \times AC \times AB \times \sin 40^\circ = \frac{1}{2} \times 1 \times 2 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$$

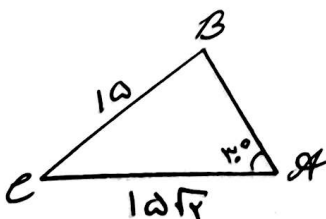
(الف)

$$P_{ABC} = AC + AB + BC = 1 + 2 + 3 = 40$$

(ب)

$$BC = \sqrt{AC^2 + AB^2 - 2ACAB \cos 40^\circ} = \sqrt{1^2 + 2^2 - 2(1 \times 2) \times \frac{1}{2}} = 1$$

(۵)



$$\hat{B} + \hat{C} = 150^\circ \rightarrow \hat{A} = 30^\circ$$

$$\frac{\sin 30^\circ}{10} = \frac{\sin \hat{B}}{10\sqrt{2}} \rightarrow \frac{1}{10} = \frac{\sin \hat{B}}{10\sqrt{2}} \rightarrow \frac{1}{10} = \frac{\sin \hat{B}}{10\sqrt{2}} \rightarrow \sin \hat{B} = \frac{\sqrt{2}}{2} \rightarrow \hat{B} = 45^\circ$$

$$\hat{B} + \hat{C} = 150^\circ \rightarrow 45^\circ + \hat{C} = 150^\circ \rightarrow \hat{C} = 105^\circ$$

$$\hat{B} = 45^\circ = \left(\frac{\pi}{4}\right) \quad \hat{C} = 105^\circ = \left(\frac{7\pi}{12}\right)$$

$$\frac{\tan(\pi - \alpha) + r \tan(\pi + \alpha)}{\tan(r\pi - \alpha) - \tan(r\pi + \alpha)} = \frac{-\tan \alpha + r \tan \alpha}{-\tan \alpha - \tan \alpha} = \frac{r \tan \alpha}{-r \tan \alpha} = (-1) \quad (9)$$

$$\tan \frac{\pi}{r} = a$$

$$r = \frac{r \tan 145^\circ + \tan 105^\circ}{r \tan 145^\circ - \tan 105^\circ} = \frac{r \tan(\frac{\pi}{r} - 15^\circ) + \tan(\frac{\pi}{r} + 15^\circ)}{r \tan(\frac{\pi}{r} - 15^\circ) - \tan(\frac{\pi}{r} + 15^\circ)} = \frac{r \cot \alpha - \cot \alpha}{-r \tan \alpha - \cot \alpha} \quad (V)$$

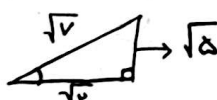
$$\frac{\sin x + \cos x}{\sin x - \cos x} + \frac{\sin x - \cos x}{\sin x + \cos x} = r = \frac{(\sin x + \cos x + \sin x \cos x) + (\sin x + \cos x - \sin x \cos x)}{(\sin x - \cos x)(\sin x + \cos x)} = (1)$$

$$\frac{r \sin x + r \cos x}{\sin x - \cos x} = \frac{r(\sin x + \cos x)}{\sin x - \cos x} = \frac{r}{1 - \cos x} = r \rightarrow 1 - r \cos x = \frac{r}{r} \rightarrow r \cos x = -\frac{1}{r}$$

$$\rightarrow \cos x = \frac{-1}{r} \rightarrow \sin x = \frac{1}{r} \rightarrow \tan x = \frac{\sin x}{\cos x} = \frac{\frac{1}{r}}{\frac{-1}{r}} = (-1) \quad (X)$$

$$\frac{\sin x - r \cos x + 1}{\sin x + r \cos x - 1} = \varepsilon \rightarrow \frac{\sin x - r + r \sin x + 1}{r \cos x + r \cos x} = \varepsilon \rightarrow \frac{r \sin x - 1}{\cos x} = \varepsilon \rightarrow \frac{r - r \cos x - 1}{\cos x} = \varepsilon \quad (9)$$

$$\rightarrow \frac{r - r \cos x}{\cos x} = \varepsilon \rightarrow \frac{r}{\cos x} - r = \varepsilon \rightarrow \frac{r}{\cos x} = \varepsilon + r \rightarrow \cos x = \frac{r}{\varepsilon + r} \rightarrow \cos = \frac{\sqrt{r}}{\sqrt{\varepsilon}}$$



$$\rightarrow \sin x = \frac{\sqrt{r}}{\sqrt{r^2 + r}} \Rightarrow \tan x = \frac{\sin x}{\cos x} = \left(\frac{1}{r} \right)$$

$$\sin x = \frac{1}{\sqrt{r}}$$

$$(الف) \cos(r, 15^\circ) \rightarrow \cos'(r, 15^\circ) = \frac{1 + \cos 2\alpha}{2} = \frac{1 + \cos 30^\circ}{2} = \frac{\frac{r+\sqrt{r}}{2}}{2} = \frac{r+\sqrt{r}}{4}$$

$$\rightarrow \cos(r, 15^\circ) = \left(\frac{r+\sqrt{r}}{4} \right)$$

$$(ب) \sin(4r, 15^\circ) \rightarrow \sin'(4r, 15^\circ) = \frac{1 - \cos 2\alpha}{2} = \frac{1 - \cos 30^\circ}{2} = \frac{\frac{r+\sqrt{r}}{2}}{2} = \frac{r+\sqrt{r}}{4}$$

$$\rightarrow \sin(4r, 15^\circ) = \left(\frac{r+\sqrt{r}}{4} \right)$$