

۳:۵۴'



$$4 \times 30 = 120^\circ$$

$$120^\circ + 2^\circ + 27^\circ = 149^\circ$$

$$\frac{27}{4} \times 30 = 202.5^\circ$$

۲. الف.

$$\alpha = |5, 2M - 30h|$$

$$39 - 20.7 = 18.3^\circ$$

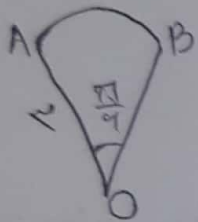
۹:۱۸'



$$\alpha: 2 \times 30 = 60 + 12 + 9 = 81^\circ$$

۳. الف.

$$\alpha = |5, 2M - 30h| = |99 - 180| = 81^\circ$$

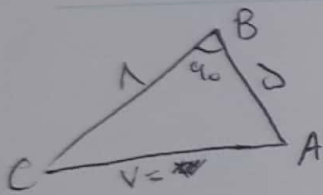


مساحت: $\frac{1}{2} \times \text{زاویه} \times R^2$

مساحت: $\frac{1}{2} \times \frac{\pi}{4} \times R^2 = \frac{29\pi}{14} = \frac{29\pi}{14}$

محیط: $(R \times \frac{\pi}{4}) + (\frac{\pi}{4} \times R) = 9 + \frac{\pi}{2}$

۴. الف.

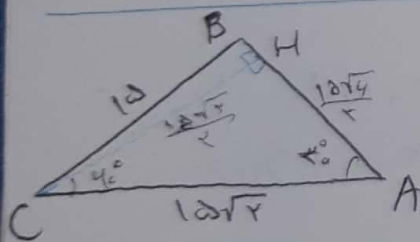


الف) مساحت مثلث ABC: $\frac{1}{2} \sin 60^\circ \times 1 \times 1 = \frac{1}{2} \times \frac{\sqrt{3}}{2} \times 1 \times 1 = \frac{\sqrt{3}}{4}$

$AC = \sqrt{1^2 + 1^2 - 2(1)(1)\cos 60^\circ} = \sqrt{2 - 1} = 1$

محیط: $V + 2 + 1 = 3$

۵. الف.



$\triangle ABC: \hat{B} + \hat{C} = 120^\circ$ $AC = 10\sqrt{3}$ $BC = 10$

$\hat{B}, \hat{C} = ?$

$\sin 60^\circ = \frac{1}{2} = \frac{CH}{10\sqrt{3}}$ $CH = 5\sqrt{3}$

$HA = \frac{10\sqrt{4}}{2} = 10\sqrt{2}$ $\frac{10\sqrt{2}}{2}$

$10 = BH \times BH + \frac{10\sqrt{4}}{2}$ $10 = x$

$\frac{10}{1} = \frac{10\sqrt{2}}{\sin B} = 20 = \frac{10\sqrt{2}}{\sin B} \Rightarrow \sin B = \frac{\sqrt{2}}{2} \rightarrow B \rightarrow 45^\circ = \left(\frac{\pi}{4}\right) = B$

استفاده از قانون سینوس

$\hat{C} = 180 - 60 - 45 = 75^\circ = 90 + 15 = \frac{\pi}{2} + \frac{\pi}{12} = \frac{5\pi}{12} + \frac{\pi}{12} = \frac{6\pi}{12} = \frac{\pi}{2} = C$

$$\frac{\tan(\pi-a) + r \tan(\pi+a)}{\tan(r\pi-a) - \tan(r\pi+a)} = \frac{-\tan a + r \tan a}{-\tan a - \tan a} = \frac{r \tan a}{-r \tan a} = \textcircled{-1}$$

(P) 9

$$\tan \frac{\pi}{r} = a \quad A = \frac{r \tan r\delta + \tan 1\delta}{r \tan(140^\circ) - \tan r\delta} \rightarrow \cot 140^\circ = \frac{1}{a}$$

(P)

$$\frac{\pi}{r} = 10^\circ \quad A = \frac{r \tan(\frac{\pi}{r} - 10^\circ) + \tan(\frac{\pi}{r} + 10^\circ)}{r \tan(\pi - 10^\circ) - \tan(\frac{\pi}{r} - 10^\circ)} = \frac{r \cot 10^\circ - \cot 10^\circ}{-r \tan 10^\circ - \cot 10^\circ} = \frac{\cot 10^\circ}{-r \tan 10^\circ - \cot 10^\circ}$$

$$\Rightarrow \frac{1}{a} = \frac{\frac{1}{a}}{-ra - 1} = \frac{1}{-ra - 1}$$

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

$$\tan^2 x = ?$$

(P)

$$\frac{\tan^2 x + 1 + \tan^2 x + 1}{\tan^2 x - 1} = \frac{r \tan^2 x + r}{\tan^2 x - 1} = r \quad r \tan^2 x - 1 = r \tan^2 x + r$$

$$\tan^2 x = \frac{1}{r}$$

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

$$\tan^2 x = ?$$

(P)

$$\frac{\tan^2 x - r + \frac{1}{\cos^2 x}}{\tan^2 x + r - \frac{1}{\cos^2 x}} \xrightarrow{\frac{1}{\cos^2 x} = \tan^2 x + 1} \frac{\tan^2 x - r + \tan^2 x + 1}{\tan^2 x + r - \tan^2 x - 1}$$

$$= r \tan^2 x - 1 = r \rightarrow \tan^2 x = \frac{1}{r}$$

$$\text{ii) } \cos^2 \frac{\pi}{r} = \frac{1 + \cos \frac{\pi}{r}}{2} = \frac{1 + \frac{1}{r}}{2} = \frac{1}{2} + \frac{1}{2r} = \frac{r+1}{2r}$$

(P)

$$\text{iii) } \sin^2 \frac{\pi}{r} = \frac{1 - \cos \frac{\pi}{r}}{2} = \frac{1 - \frac{1}{r}}{2} = \frac{1}{2} - \frac{1}{2r} = \frac{r-1}{2r}$$