

الف) ۳:۵۴

ب) $|5/5M - 30h| =$

$(30 \times 4) + (1 \times 2) + (\frac{54}{6}) = 153^\circ$

$|5/5 \times 4 - 30 \times 3| = 207$

چون نصف النهار از ۱۸۰ باشد و ما زاویه برائستاز
۱۸۰ حساب می‌کنیم پس
 $340 - 207 = 153 =$

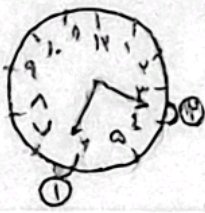


الف) ۶:۱۱

ب) ۶:۱۱

$(2 \times 4) + (2 \times 30) + (\frac{11}{6}) = 11^\circ$

$|5/5 \times 11 - 30 \times 6| = 11^\circ$



الف) $S = \frac{\alpha}{\pi} r^2$

ب) $S = 2r + \alpha r$

$\frac{\pi}{6} \times (\frac{3}{2})^2 = \frac{\pi}{12} \times 9 = \frac{9\pi}{12}$

$(2 \times 3) + (\frac{\pi}{6} \times 3) = 4 + \frac{3\pi}{6}$

$\rightarrow 4 + \frac{\pi}{2}$



الف) $S = AB \times AC \times \frac{1}{2} \times \sin A$

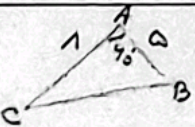
$\rightarrow S = 5 \times 1 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$

ب) $a = \sqrt{b^2 + c^2 - 2bc \cos \theta}$

$\rightarrow a = \sqrt{1^2 + (5)^2 - (2 \times 5 \times 1 \times \cos 60^\circ)}$

$a = \sqrt{29} = \sqrt{29}$

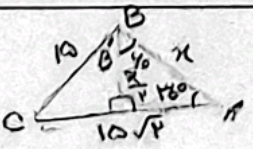
$\text{محيط} = a + b + c = 1 + 5 + \sqrt{29} = 20$



$\hat{B} + \hat{C} = 150^\circ$ $BA = x \rightarrow BH = \frac{x}{2}$ $\angle B = 45^\circ \times \frac{\pi}{180} = \frac{\pi}{4}$

$\frac{15}{\sin 60^\circ} = \frac{15\sqrt{2}}{\sin B} = 30$ $\angle C = 105^\circ \times \frac{\pi}{180} = \frac{7\pi}{12}$

$\sin B = \frac{15\sqrt{2}}{30} = \frac{\sqrt{2}}{2}$



$$\tan(\pi - \alpha) = -\tan \alpha \quad - \quad \tan(\pi + \alpha) = \tan \alpha$$

$$\tan(2\pi - \alpha) = -\tan \alpha \quad - \quad \tan(2\pi + \alpha) = \tan \alpha$$

$$\frac{\tan(\pi - \alpha) + \tan(\pi + \alpha)}{\tan(\pi - \alpha) - \tan(\pi + \alpha)} = \frac{-\tan \alpha + \tan \alpha}{-\tan \alpha - \tan \alpha} = \frac{0}{-2\tan \alpha} = 0$$

$$\tan \frac{\pi}{4} \rightarrow \frac{\pi}{4} = \frac{n}{140} \rightarrow \frac{1}{4} = \frac{n}{140} \rightarrow n = 35 = \alpha \rightarrow \tan \alpha = \tan(35^\circ)$$

$$\tan \frac{\pi}{4} = \tan(\frac{\pi}{4} - \alpha) = \cot \alpha$$

$$\tan 105^\circ = \tan(\frac{\pi}{4} + \alpha) = -\cot \alpha$$

$$\tan 140^\circ = (\pi - \alpha) = -\tan \alpha$$

$$\tan 140^\circ = \tan(\frac{\pi}{4} - \alpha) = \cot \alpha$$

$$\frac{\cot \alpha - \cot \alpha}{\cot \alpha - \cot \alpha} = \frac{\cot \alpha}{\cot \alpha} = 1$$

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

$$\frac{1 - \cos^2 x}{1 - \cos^2 x} \Rightarrow \frac{1}{1 - \cos^2 x} = 1 \Rightarrow 1 - \cos^2 x = 1 \Rightarrow \cos^2 x = 0 \Rightarrow \cos x = 0$$

$$\rightarrow \cos^2 x + \sin^2 x = 1 \rightarrow \sin^2 x = 1 \rightarrow \sin x = \pm 1 \rightarrow \tan x = \frac{\pm 1}{0} = \pm \infty$$

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

$$\cos^2 x = 1 \rightarrow \cos x = \pm 1 \quad \cos^2 x + \sin^2 x = 1 \rightarrow \frac{1}{4} + \sin^2 x = 1 \rightarrow \sin^2 x = \frac{3}{4} \rightarrow \sin x = \pm \frac{\sqrt{3}}{2}$$

$$\tan x = \frac{\pm \frac{\sqrt{3}}{2}}{\pm 1} = \pm \frac{\sqrt{3}}{2} = \pm \frac{\sqrt{3}}{2}$$

$$\cos(2\pi/3) = \cos 120^\circ = \cos 2\pi/3 = -1/2 \rightarrow \cos 2\pi/3 = \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{3}}{2}$$

$$\sin 2\pi/3 = \frac{\sqrt{1 - \cos^2 2\pi/3}}{2} = \frac{\sqrt{1 - 1/4}}{2} = \frac{\sqrt{3/4}}{2} = \frac{\sqrt{3}}{4}$$