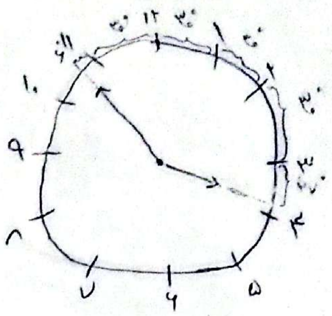
آیلا جعفری - تکلیف نوزدهم - دهم رشته A

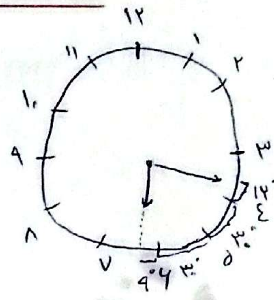
۱-



الف) $6 + 30 + 30 + 30 + 30 + 27 = 153^\circ$

ب) $|5{,}5M - 30H| = |5{,}5 \times 54 - 3 \times 30| = |-207^\circ| = 207^\circ \xrightarrow[\text{معمولا زاویه کوچکتر رو میگیم...}]{} 153^\circ$

۲-



الف) $30 + 30 + 12 + 9 = 81^\circ$

ب) $|5{,}5M - 30H| = |5{,}5 \times 18 - 30 \times 6| = |-81| = 81^\circ$

۳-

الف) $S = \frac{\alpha}{2} \cdot R^2 = \frac{\pi}{12} \times 9 = \frac{9\pi}{12} = \frac{3\pi}{4}$

ب) $P_{AOB} = 2R + \underbrace{(\alpha \cdot R)}_{\text{طول کمان } AB} = 6 + \left(\frac{\pi}{6} \times 3\right) = 6 + \frac{\pi}{2}$

۴-

الف) $S_{ABC} = \frac{1}{2} AB \cdot AC \cdot \sin 60^\circ = \frac{1}{2} \times 5 \times 8 \times \sin 60^\circ = 20 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$

ب) $\rightarrow BC = ? = \sqrt{AB^2 + AC^2 - 2AB \cdot AC \cdot \cos 60^\circ} = \sqrt{5^2 + 8^2 - 2(5)(8)\frac{1}{2}} = \sqrt{49} = 7 \Rightarrow P_{\text{مثلث}} = 7 + 5 + 8 = 20$

۵-

قانون سینوس‌ها $\rightarrow \frac{a}{\sin A} = \frac{b}{\sin B} \rightarrow \frac{15}{\underset{\frac{1}{2}}{\sin 30^\circ}} = \frac{15\sqrt{2}}{\sin B} \rightarrow \sin B = \frac{\frac{15\sqrt{2}}{2}}{\frac{15}{1}} = \frac{15\sqrt{2}}{30} = \frac{\sqrt{2}}{2} \Rightarrow \hat{B} = 45^\circ \rightarrow \hat{C} = 180^\circ - 30^\circ - 45^\circ = 105^\circ$

$\Rightarrow \hat{B} = 45^\circ = \frac{\pi}{4}$ و $\hat{C} = 105^\circ = ?\,Rad \rightarrow \frac{Rad}{\pi} = \frac{105}{180} = \frac{7}{12} \rightarrow Rad = \frac{7\pi}{12} \Rightarrow \hat{B} = \frac{\pi}{4},\ \hat{C} = \frac{7\pi}{12}$

۶-

$\frac{\tan(\pi - \alpha) + 3\tan(\pi + \alpha)}{\tan(2\pi - \alpha) - \tan(2\pi + \alpha)} = \frac{-\tan\alpha + 3\tan\alpha}{-\tan\alpha - \tan\alpha} = \frac{2\tan\alpha}{-2\tan\alpha} = -1$

۷-

$\rightarrow \frac{\pi}{12} = 15^\circ \rightarrow \frac{2\tan(90 - 15) + \tan(90 + 15)}{3\tan(180 - 15) - \tan(270 - 15)} = \frac{2\cot 15^\circ - \cot 15^\circ}{-3\tan 15^\circ - \cot 15^\circ} = \frac{\frac{2}{a} - \frac{1}{a}}{-3a - \frac{1}{a}} = \frac{\frac{1}{a}}{\frac{-3a^2 - 1}{a}} = \frac{-1}{3a^2 + 1}$

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

۸-

$\rightarrow \frac{2(\sin^2 x + \cos^2 x) - 2\cos x \sin x + 2\sin x \cdot \cos x}{\sin^2 x - \cos^2 x} = \frac{2}{\sin^2 x - \cos^2 x} = 3 = \frac{2}{1 - \cos^2 x - \cos^2 x} \rightarrow 3(1 - 2\cos^2 x) = 2$

$3 - 6\cos^2 x \rightarrow \cos^2 x = \frac{1}{6}$

$\Rightarrow 1 + \tan^2 x = \frac{1}{\cos^2 x} \rightarrow 1 + \tan^2 x = 6 \rightarrow \tan^2 x = 5$

۹.

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

$$\rightarrow 7\cos^2 x = 2 \rightarrow \cos^2 x = \frac{2}{7}$$

$$\Rightarrow 1+\tan^2 x = \frac{1}{\cos^2 x} \rightarrow \tan^2 x = \frac{7}{2}-1 = \frac{5}{2}$$

۱۰.

الف) $$\cos^2\alpha = \frac{1+\cos 2\alpha}{2} \rightarrow \cos^2(22{,}5) = \frac{1+\cos 45^\circ}{2} = \frac{1+\frac{\sqrt{2}}{2}}{2} = \frac{2+\sqrt{2}}{4} \rightarrow \cos(22{,}5) = \underset{\text{ربع اول}}{\pm}\frac{\sqrt{2+\sqrt{2}}}{2} \Rightarrow = \frac{\sqrt{2+\sqrt{2}}}{2}$$

ب) $$\sin^2\alpha = \frac{1-\cos 2\alpha}{2} \rightarrow \sin^2(67{,}5^\circ) = \frac{1-\cos 135^\circ}{2} = \frac{1-\left(-\frac{\sqrt{2}}{2}\right)}{2} = \frac{1+\frac{\sqrt{2}}{2}}{2} \rightarrow \sin(67{,}5^\circ) = \underset{\text{ربع اول}}{\pm}\sqrt{\frac{2+\sqrt{2}}{4}} \Rightarrow = \frac{\sqrt{2+\sqrt{2}}}{2}$$