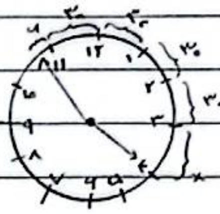
/ /

مونا عباسی — پنجشنبه

۲۰

۱
$x = \frac{۵۴}{۲} = ۲۷$



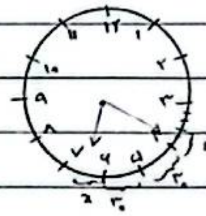
ب) $|۳۰h - ۵٫۵m| =$

$|۳۰\times۳ - ۵٫۵(۵۴)| = |-۲۰۷| = ۲۰۷$

$۳۶۰ - ۲۰۷ = ۱۵۳^\circ$

الف) $۲۷+۶+(۴\times۳۰) = ۱۵۳$

۲
$x = \frac{۱۸}{۲} = ۹$



الف) $۹+(۲\times۶)+(۲\times۳۰) = ۸۱$

ب) $= |۳۰h - ۵٫۵m| = |۳۰\times۴ - (۵٫۵\times۱۸)| = |۸۱| = ۸۱$

۳

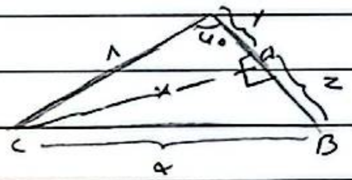
$S = \frac{\alpha}{۲}R^۲ = \frac{\frac{\pi}{۶}}{\frac{۲}{۱}}\times ۳^۲ = \frac{\pi}{۱۲}\times ۹ = \frac{۳\pi}{۴}$

ب) $P = \alpha R + ۲R = \frac{\pi}{۶}\times۳ + ۲\times۳ = \frac{\pi}{۲}+۶$

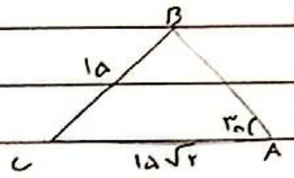
۴
الف) $S_{\overset{\triangle}{ABC}} = \frac{۱}{۲}bc\sin A = \frac{۱}{۲}\times۸\times۵\times\frac{\sqrt{۳}}{۲} = ۱۰\sqrt{۳}$

ب) $x = \frac{\sqrt{۳}}{۲}\times۸ = ۴\sqrt{۳} \to y = \sqrt{۸^۲-(۴\sqrt{۳})^۲} = ۴$ $\quad z = ۵-۴ = ۱$

$a = \sqrt{(۴\sqrt{۳})^۲+۱^۲} = ۷$



۵



$\hat{B}+\hat{C} = ۱۵۰ \to \hat{A} = ۱۸۰-۱۵۰ = ۳۰$, $\frac{a}{\sin A} = \frac{b}{\sin B}$

$\frac{۱۵}{\frac{۱}{۲}} = \frac{۱۵\sqrt{۲}}{\sin B} \to \sin B = \frac{\sqrt{۲}}{۲}$ $\quad B \begin{cases} ۴۵ & \text{زاویه حاده است} \\ ۱۳۵ \times \end{cases}$

$\hat{B} = \frac{\pi}{۴}$, $\hat{C} = ۱۸۰-(۳۰+۴۵) = ۱۰۵$ $\quad \frac{D}{۱۸۰} = \frac{Rad}{\pi}$ $\quad C = \frac{۷\pi}{۱۲}$

۶
$\frac{\tan(\pi-\alpha)+۳\tan(\pi+\alpha)}{-\tan(۲\pi-\alpha)-\tan(۲\pi+\alpha)} = \frac{-\tan(\alpha)+۳\tan(\alpha)}{-\tan(\alpha)-\tan(\alpha)} = \frac{۲\tan(\alpha)}{-۲\tan(\alpha)} = -۱$

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۷ـ

$$\frac{\frac{\pi}{12}}{\frac{\pi}{1}} = \frac{D}{180} \longrightarrow D = 15 \qquad A = \frac{\tan 75 + \tan 105}{3\tan 165 - \tan 285} = \frac{2\tan(\frac{\pi}{2} - \alpha) + \tan(\frac{\pi}{2} + \alpha)}{3\tan(\pi - \alpha) - \tan(\frac{3\pi}{2} - \alpha)}$$

$$= \frac{2\cot(\alpha) - \cot(\alpha)}{-3\tan(\alpha) - \cot(\alpha)} = \frac{\cot(\alpha)}{-3\tan(\alpha) - \cot(\alpha)} = \frac{\frac{1}{a}}{-3a - \frac{1}{a}} = \frac{\frac{1}{a}}{\frac{-3a^2 - 1}{a}} = \frac{1}{-3a^2 - 1}$$

۸ـ

$$\frac{\sin x + \cos x}{\sin x - \cos x} + \frac{\sin x - \cos x}{\sin x + \cos x} = 3$$

$$\frac{(\sin x + \cos x)(\sin x + \cos x) + (\sin x - \cos x)(\sin x - \cos x)}{(\sin x - \cos x)(\sin x + \cos x)} = 3$$

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

$$\sin^2 = \frac{2}{3} + \cos^2 \longrightarrow \sin^2 + \cos^2 = 1 \longrightarrow \frac{2}{3} + \cos^2 + \cos^2 = 1$$

$$\cos^2 = \frac{1}{6} \qquad \sin^2 = \frac{2}{3} + \frac{1}{6} = \frac{5}{6} \qquad \tan^2 = \frac{\frac{5}{6}}{\frac{1}{6}} = 5$$

۹ـ

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

$$7\cos^2 = 2 \longrightarrow \cos^2 = \frac{2}{7} \qquad \sin^2 = 1 - \frac{2}{7} = \frac{5}{7} \qquad \tan^2 = \frac{\frac{5}{7}}{\frac{2}{7}} = \frac{5}{2}$$

۱۰ـ الف) $\cos(22/5) \longrightarrow \cos^2\alpha = \frac{1 + \cos 2\alpha}{2} \longrightarrow \cos^2 22/5 = \frac{1 + \cos 45}{2}$

$$\frac{1 + \frac{\sqrt{2}}{2}}{2} = \frac{\frac{2 + \sqrt{2}}{2}}{\frac{2}{1}} = \frac{2 + \sqrt{2}}{4} \qquad \cos 22/5 = \sqrt{\frac{2 + \sqrt{2}}{4}} = \frac{\sqrt{2 + \sqrt{2}}}{2}$$

ب) $\sin(67/5) \longrightarrow \sin^2 x = \frac{1 - \cos 2x}{2} \qquad \sin^2 67/5 = \frac{1 - \cos 135}{2}$

$$= \frac{1 - (-\frac{\sqrt{2}}{2})}{2} = \frac{2 + \sqrt{2}}{4} \qquad \sin 67/5 = \sqrt{\frac{2 + \sqrt{2}}{4}} = \frac{\sqrt{2 + \sqrt{2}}}{2}$$

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