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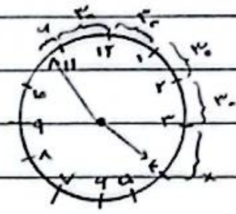
مونا عباسی — پنجشنبه

۱)



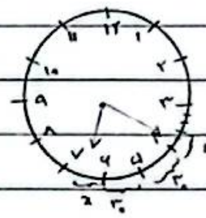
$x = \frac{54}{2} = 27$

الف) $27 + 6 + (4 \times 30) = 153$

ب) $|30h - 5/5m| = |30 \times 3 - 5/5(54)| = |-207| = 207$

$360 - 207 = 153°$

۲)



$x = \frac{18}{2} = 9$

الف) $9 + (2 \times 6) + (2 \times 30) = 81$

ب) $|30h - 5/5m| = |30 \times 6 - (5/5 \times 18)| = |81| = 81$

۳)

$S = \frac{\alpha}{2} R^2 = \frac{\frac{\pi}{4}}{\frac{2}{1}} \times 3^2 = \frac{\pi}{12} \times 9 = \frac{3\pi}{4}$

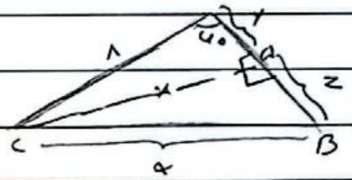
ب) $P = \alpha R + 2R = \frac{\pi}{4} \times 3 + 2 \times 3 = \frac{\pi}{2} + 6$

۴)

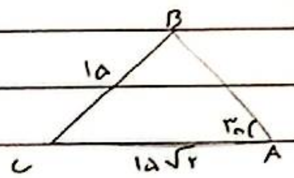
الف) $S_{\overset{\Delta}{ABC}} = \frac{1}{2} bc \sin A = \frac{1}{2} \times 8 \times 5 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$

ب) $x = \frac{\sqrt{3}}{2} \times 8 = 4\sqrt{3}$ → $y = \sqrt{8^2 - (4\sqrt{3})^2} = 4$ $z = 5 - 4 = 1$

$a = \sqrt{(4\sqrt{3})^2 + 1^2} = 7$



۵)



$\hat{B} + \hat{C} = 150 \rightarrow \hat{A} = 180 - 150 = 30$ ، $\frac{a}{\sin A} = \frac{b}{\sin B}$

$\frac{15}{\frac{1}{2}} = \frac{15\sqrt{2}}{\sin B} \rightarrow \sin B = \frac{\sqrt{2}}{2}$ $B \begin{cases} 45 & \text{زاویه حاده است} \\ 135 \times \end{cases}$

$\hat{B} = \frac{\pi}{4}$ ، $\hat{C} = 180 - (30 + 45) = 105$ $\frac{D}{180} = \frac{R}{\pi}$ $C = \frac{7\pi}{12}$

۶)

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

Parsian

$\frac{\pi}{12} = \frac{D}{180} \Rightarrow D = 15$ $\quad A = \frac{\tan 75 + \tan 15}{2\tan 14 - \tan 28}$ $\quad \frac{2\tan(\frac{\pi}{2}-\alpha)+\tan(\frac{\pi}{2}+\alpha)}{2\tan(\pi-\alpha)-\tan(\frac{3\pi}{2}-\alpha)}$

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

۸- $\frac{5\sin x+\cos x}{5\sin x-\cos x} + \frac{\sin x-\cos x}{5\sin x+\cos x} = 2$

$\frac{(5\sin x+\cos x)(5\sin x+\cos x)+(5\sin x-\cos x)(5\sin x-\cos x)}{(5\sin x-\cos x)(5\sin x+\cos x)} = 2$

$\frac{25\sin^2 x+\cos^2 x+10\sin x\cos x+25\sin^2 x+\cos^2 x-10\sin x\cos x}{25\sin^2 x-\cos^2 x} = 2 \quad 2 = 2(25\sin^2 x-\cos^2 x)$

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

$\cos^2 = \frac{1}{4}$ $\quad \sin^2 = \frac{2}{3} + \frac{1}{4} = \frac{11}{12}$ $\quad \tan^2 = \frac{\frac{11}{12}}{\frac{1}{4}} = 11$

۹- $\frac{5\sin^2 x-2\cos^2 x+1}{5\sin^2 x+2\cos^2 x-1} = 4$ $\quad \frac{1-\cos^2 x-2\cos^2 x+1}{1-\cos^2 x+2\cos^2 x-1} = 4$

$7\cos^2 = 2 \Rightarrow \cos^2 = \frac{2}{7}$ $\quad \sin^2 = 1-\frac{2}{7} = \frac{5}{7}$ $\quad \tan^2 = \frac{\frac{5}{7}}{\frac{2}{7}} = \frac{5}{2}$

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

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

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

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